Hartwig Haubrich (ed.)

Europe and the World
in Geography Education

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Hartwig Haubrich, Jürgen Nebel, Helmut Schrettenbrunner und Arnold
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Contributors

Biilmann, Ove/Denmark
Danmarks Laererhojskole Copenhagen

Gerber, Rod/Australia
Queensland University of Technology Brisbane

Hall, David/United Kingdom
University of Bristol

Hartmann, Rudi/USA
University of Colorado at Denver

Haubrich, Hartwig/Germany
Paedagogische Hochschule Freiburg

Hill, A. David; Richburg, Robert W. and Klein, Phil/USA
University of Colorado at Denver

Huckle, John/U.K.
Bedford College of Higher Education Bedford

Hübbe, Tonny/Denmark
Danmarks Laererhojskole Copenhagen

Kwan, Tammy/Australia John Lee/Hong Kong
Queensland University of Technology Brisbane

Larsen, Keld Juhl/Denmark
Danmarks Laererhojskole Copenhagen

Lee, John/Hong Kong
The University of Hong Kong

Livni, Shimshon and Bar, Varda/Israel
The Hebrew University Jerusalem

Marbeau, Lucile/France
Institut National de Recherche Pédagogique Paris

Marsden, William E./United Kingdom
University of Liverpool

Maye, Brian/Australia
The University of New England Armidale

Miller, Gary E.
Old Dominon University in Norfolk Virginia

Naish, Michael/United Kongdom
University of London

Ostuni, Josefina/Argentina
University of Mendoza

Purnell, Kenneth N./Australia
Central Queensland University Rock Hampton

Rikkinen, Hannele/Finland
University of Helsinki

Robertson, Margaret/Tasmania
University of Tasmania

Rohwer, Gertrude
Freie Universität Berlin

Schrettenbrunner, Helmut/Germany
Universität Erlangen-Nürnberg

Smit, Theo/Republic of South Africa
University of Cape Town

Smit, Mike J./Republic of South Africa
University of Stellenbosch

Stimpson, Philip/Hong Kong
The University of Hong Kong

Stoltman, Joseph P./USU
Western Michigan University/Kalamazoo

Tait, Norman C./Republic of South Africa
University of the North Pietersburg

Thomas, Paul F./Canada
University of Victoria

Volkmann, Hartmut/Germany
Universität Bochum

Werner, Margit/Sweden
Göteborgs Universitet

Williams, Michael/United Kingdom
University College of Swansea/Wales

Wolforth, John/Canada
McGill University Montreal

Xuan, Shi/China P.R.
The No. 10 Middle School Wuhan

Zamorano de Montiel, Gloria Leticia/Argentina
Universidad Nacional de Cuyo Mendoza

Zeigler, Donald J./USA
Old Dominon University in Norfolk Virginia
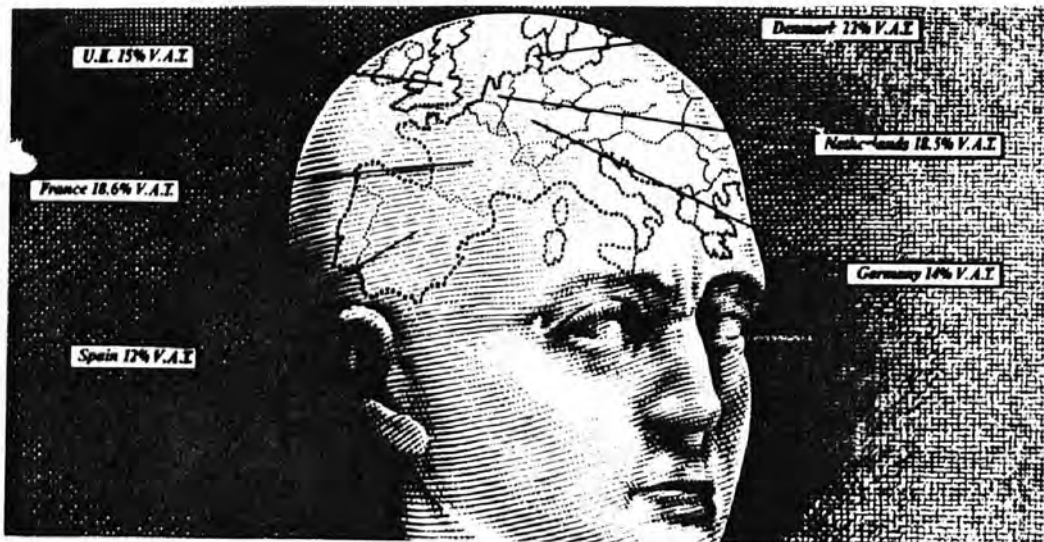
fig. 1 Brainwave or Headache? (Newsweek)

fig. 2 I think European, therefore I am. (Newsweek)

INTRODUCTION: EUROPE AND THE WORLD

Hartwig Haubrich

Introduction: Europe and the World

The following paper has the function to introduce into the topic of the conferences of IGU/CGE in Berlin and Prague and to present some basic information about the perception and definition of Europe, some European problems and spatial processes.

Europe in our mind

What do we feel when we think about Europe: joy or headaches?
Figure 1 shows the face and head of a businessman with the European map in his mind and who seems to get headaches when he thinks about the differences of V.A.T.s in the different European countries.
Is that the famous attribute of Europe: diversity in unity?
The question is: What put we in this cognitive map of Europe in order to sense joy and not headaches?
Figure 2 shows a model of an European face or head covered by some European national flaggs but without the European flagg.
Is that a silent message of Europe of the nations?
The text below this European face seems to be of more importance than the figure itself.
It reads:
> *"I think European, therefore I am."*

If you are proud to be an European, you could read the text adversely-namely:
> *"I am European, therefore I think."*

In this moment you are giving Europe an idea or goal – namely:
> *"Europe as the continent of Enlightment".*

The text reads further:
> *"Being European is not a question of nationality, it's an attitude of mind."*

Europe is a complex task and big challenge!
It is difficult to understand it and many people don't understand it.
After the contrary discussions about the Maastricht Treaty and the critical outcomes of the votings those who like the European Idea began to inform people about the potential European future more than before, telling them that "Europe is great", but many Europeans have difficulties to accept that.

Definition of Europe

In order to understand Europe it is basically necessary to define Europe, although it is not easy to do it.

The traditional border of Europe up to the Ural divides Russia, and up to Istambul seperates Turkey. These are just 2 arguments against the classical definition of Europe.

You may know the legend of Europe's origin. Europe was a daughter of a Phoenecian king. She was so pretty that God Zeus fell in love with her and tried to marry her. He changed into a figure of a beautifull bull and invited her to ride on his back. So he brought her to Crete. There he showed her his right figure as God and married her. Minos, one of 3 sons of Zeus and Europe, became king of Crete, where Orient and Occident smelted together and created the Minoik culture, followed by the Hellenistic culture, from which the spirit of Europe expanded to the current continent of Europe. This hellenistic spirit of Europe means rationality, aesthetics and democracy.

But we know too that the Greeks called people outside of their country "barbarians".

There is another, more simple explanation of the word Europe.

It is said that Europe comes from the Arabic word "ereb".

Tradesmen from the Middle East called Greece in the West, where the sun was setting in the evening, ereb, i.e. sun setting or occident, and the East, where the sun was rising in the morning, orient. So does Europe mean the continent of sun setting.

If you look at Europe's culture and philosophy it is originated not in the current continent of Europe but in the orient or at least at the border between orient and occident. The same is true for christianity which comes from Asia and meanwhile christianity has expanded all over the world. Other continents are also christian continents.

If you look at the European languages. There is no common language. There are so many languages and some are also spoken outside of Europe as English, Spain, Portugese, French and not to forget Russian. So we can speak about the Europeanisation of the World.

If you look into history. How did Europe develop? After the Greek epoch followed the Roman Empire, but it didn't cover whole Europe. Christianity was of course of importance for Europe. But the First Rome was followed by the Second Rome in Byzanz and the Third Rome in Moscow, the different Orthodox Churches in the East and the different protestant Churches in the West. Even christianity divided Europe.

"Diversity in Unity" is an often used definition of Europe but it is easier to find the diversities than the unities.

The European Community is smaller than Europe and the NATO is bigger than Europe. The Council of Europe is on the frontier of the European process. More than 30 but not all European countries are members. The Conference on Security and Cooperation in Europe in 1990 was attended by all European countries beside Albania.

It is quite difficult to define Europe. Most important are the European Ideas, i.e. enlightment, freedom, justice, human rights, cooperation, peace; but these ideas are not just European ideas. They belong to the cultural heritage of humankind. At a conference in Strasbourg - as we didn't find a solution - we defined Europe as an open system.

Europe and the World

Not just in mass media but also in academic publications one can often find a kind of eurocentristic perception of the world. Harold Elliott analysed the mental maps of many scientists. The world map I selected is the mental map of G.W. Friedrich Hegel:

Hegel, a famous German philosopher, lived from 1770 to 1831. In his opinion, the true theater of history was the north temperate zone, specifically the northern half. As Hegel's mental map indicates, this northern half included Germany and its immediate neighbours.

Hegel depicted Germany as the foremost nation in the world and referred favorably to the other Germanic nations of northern Europe. America also received high praise. Because it had been settled by Protestants, the United States was noted for freedom, civil order, and prosperity. According to Hegel, the hot-headed French were strangers to the whimsical originality of the English.

Southern Europeans were depicted as the products of an intermingling of races. The Latin countries perpetuated disharmony, which arose from the fusion of Roman and German blood. Slavic peoples were without any notions of pure individuality and therefore would be unable to share in the benefits of the freedom that was dawning in the world. The civilization of the Italians had attained the grade of beauty, but not that of rationality, while the Turks were described as a terrible people who threatened to overwhelm Europe in a barbarian invasion a.s.o.

Behind our mental maps you can often - although not ever - find the model of regional ratings from highest praise in the homeland up to the barbarians in the biggest geographical or psychological distances. This is true not just world-wide but also Europe-wide.

In European schools we often use Mercator world maps, because it shows Europe in the middle of the world and it shows Europe bigger than for example South-america, although it isn't. The Peters projection shows Europe very small, although in the middle. But school maps in Asia or in America have sometimes Europe not in the middle. It is good to see that, in order to avoid Eurocentrism. But also Europeans perceive Europe from different centres, i.e. from the perspective of their homeregion.

Some European Problems

Disparities:
The EC and some other western European countries show a high level of GDP per person: Luxembourg and Switzerland 30.000 US $, Westgermany 24.000 US $, Spain 12.000 US $, but Hungary 5.000 US $ or Albania less than 1000 US $. These abstract disparities come to life when you meet for example an Albanian teacher who earns 20 US $ per month or when you meet a Russian university professor who tells you that the price for a food basket has increased 400-times, but his salary just 4-times, that 1 pound meat costed 2 rubel 2 years ago and now 400 rubel, that the rent of flats has increased 50-times.

The unemployment rate, income, consumption and other indicators always show the big disparities not just between states but even more between regions within one state.

Finland

15 Iceland

Norway 16   17 Sweden   14

Real GDP in billions
of US dollars

20 billion
5 billion

12 UK

Ireland 7

Netherlands

2 Denmark

27 Estonia

28 Latvia

29 Lithuania

22   31   Belarus

10

3 Germany

1 Belgium

Luxembourg

32 Ukraine

6 France

20 Czecho-slovakia

25 Albania
19 Bulgaria
4 Greece
21 Hungary
22 Poland
23 Romania
26 Yugoslavia

Boundaries:

of EC
of former USSR
within former USSR
between other countries

Switzerland 18   13 Austria

21

30 Moldova

23

33 Georgia
34 Armenia
35 Azerbaijan

26

19

5 Spain

8 Italy

11 Portugal

25   4

37 Turkey

Morocco   40 Tunisia

39   38

Algeria

24 Malta

36 Cyprus

fig. 3   European Countries according to the total Gross Domestic Product 1987
(source: Cole 1993)

Ethnocentrism and War:

Former Yugoslavia has broken into 6 republics and it is discussed to divide Bosnia-Hercegowina into 3 autonomous states. A terrible war terrifies the Europeans, but it is likely that the Europeans are not able to stop it and to guarantee peace and justice. If Europe cannot manage this current challenge it cannot be expected that many people commit themselves for the European idea. On the other side it seems that many people in Europe are not prepared and able to manage a multiethnic or multicultural society. Of course, there are a lot of other reasons for present tensions - historical, social, economic and political reasons - but nationality, race, culture and religion seem to be the most obvious reasons for xenophobia, terrorism and war.

Separatism:

One result of the disintegration process is the dissolution of the earlier SU, i.e. the so-called CIS. Now there are 15 more or less independent states instead of the USSR - as Belorussia, Ukraine, Moldova, Russia, Georgia, Armenia etc. - beside the totally independent Baltic states. But also other nationalities in 20 different so-called earlier autonomous republics are partly working on their independence. Not seldom they force their minorities through terror out of their territories. The ethnic mixture

of the CIS states with more than 100 nationalities is incredible. For example in Kasachstan live more Russians (41 %) than Kasachs (36 %). Since 1989 there are now 14.000 km new international borders and more than 20 new states in Europe.

Migration:
40 mio citizens of the former SU don't live in their home territory. 25 mio Russians live outside Russia. Tatjana Regent, director of a new Russian migration service centre expects up to 2000 ten mio Russian refugees back in Russia - coming from the Baltic Republics, Ukraine, Belorussia, Moldova etc., where they often aren't liked very much. Nobody knows how many refugees exist in war regions as Moldova and Caucasus. It is said that 7 mio Ukraines want to return to Ukraine. This list of population flows is not complete.

But migration is nothing new. In the 19th century more than 50 mio Europeans emigrated mainly to Northamerica but also to Latinamerica, Africa, Australia and Sibiria. More than 30 mio went to USA.

The 2nd world war didn't just lead to 30 mio deaths but also to 11 non-German displaced persons and more than 8 mio Germans. These population streams took place mainly from East to West in Central Europe.

After the last world war up to now we have mainly labour migration in Europe. Labours with their families came from peripheral countries to central countries in the western part of Europe.

Migration effects:
The emigration in sending communities in the so-called periphery caused not just declining population but also a unhealthy age structure and an imbalance between males and females. It is easy to imagine how the population- and brain-drain leads to a lack of investment and infrastructure, i.e. to a general deprivation in the periphery.

Brunet's banana shows some effects of the flows of people, capital and know-how to the so-called centre of Europe: the megalopolis from London to Rome - becoming weaker in the North and stronger in the South, the moving gravitation centre from northern Central Europe to southern Central Europe, with new induced axes and developing regions, with the high tech belt in the centre and the under-developed belt at the periphery, but also with a new sun belt in the North of the South. This view about territorial trends in Europe is from the late 80ies. Today it is not clear what will happen in the East with reviving axes as Berlin - Warsaw - Moscow or Vienna - Istambul, nobody knows, but it is quite clear that the centres remain privileged inspite of an influx of sometimes unliked, but needed immigrants.

Europe is a Process

Europe is a process. Europe is on the way. Europe will find the right way, when the Europeans want it and work on it.

European Union:
The EC started with 6, increased to 9, to 11 and than to 12 and it can be expected that this process has not ended.

The people of the member states differ in many aspects, but they also share many common interests. The biggest countries have got more than 50 mio people,

the smallest less than 5 mio and the intermediate group embraces 10 - 15 mio people. Spain with 40 mio approaches the group of the biggest states.

The economic power of the 350 mio EU people comes from differently productive states. The 4 biggest states produce 16 - 26 % of the economic product each, that is together 80 %, 4 from 12 states produce 80 % of the total product. Although the EU people are about to discuss a future monetary and political union contrarily, first time in history they are experiencing the so-called 4 freedoms - the freedom of choice of residence and workplace, - of mobility of goods, capital and services. At least in the eyes of non-member states the EU has been quite successfull.

European Economic Space:
The success of the EC is the reason why most countries of the European Free Trade Association are going to join the EC. This new European Economic Space - EC + Iceland, Norway, Sweden, Finland, Austria, Liechtenstein and may be also one day Switzerland -although the referendum ended with a "no" last year - this enlarged Economic Community embraces 7 % of the earth population but produces 30 % of the world economic product and handles 43 % of the world trade. Its economic power is bigger than that of the USA. There is not so much reason to be proud of it, but there is enough reason to take over more responsibility for whole Europe and the rest of the world.

Europe: Unification and/or Separation

The European Union looks like the power centre of Europe. Beside it's member states there are those countries which have applied for membership as Austria, Cyprus, Malta, Sweden, Finland, Norway and may be Switzerland in the near future, followed by the EU associated countries as Poland, Czech Republic, Slovak Republic, Hungary and Turkey and last but not least a group of young countries which basically wish to become a EU member as Slovenia, Croatia, Estonia, Lithuania and Latvia.

More than these countries - namely 31 countries - are meanwhile members of the Council of Europe which has been promoting the European idea at the frontier before economic and political cooperation followed.

This constellation illustrates an integration process from West to East, but we all know that there is a lot of disintegration too - economic, social and political tensions and disagreements about the future development predominantly in the West and seperatism, so-called ethnic cleansing, terrorism and war predominantly in East and SE.

Conclusion

The above analysis shows on the one hand how difficult it is to understand Europe and to solve its problems, on the other hand Europe - at least a part of it - belongs to the most prosperous regions in the world. The Europeans have to take over the responsibility for their continent - without forgetting their solidarity with the World.

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1.0 THE EUROPEAN DIMENSION IN GEOGRAPHY EDUCATION

Hartmut Volkmann

Abstract

By tradition geographical education has dealt with the description of regions and gives reasons for their development. In future it will not be enough to point out the disparities in Europe and their causes. At a time when distances shrink and transform potential enemies into near neighbours, when poverty and warfare make people leave their homes by the thousands school education has to go farther. It has to establish a sense of solidarity with the less-well-off peoples leading to readiness to share one's own fortune with them.

DISPARITIES AND SOLIDARITY -
A MAJOR THEME FOR GEOGRAPHICAL EDUCATION

Hartmut Volkmann

Abstract

By tradition geographical education has dealt with the description of regions and partly shown the reason for their development. In future it will not be enough to point out the disparities in Europe and their causes. At a time when distances shrink and formerly separated countries become close neighbours, when poverty and warfare make people leave their homes by ten thousands school education has to go further: it has to establish a sense of solidarity with the less-well-off peoples leading to readiness to share one's own fortunes with them.

1. Disparities in defining Europe

The political changes around 1990 have changed the map of Europe fundamentally. What used to be separated has been unified again and what used to be one entity was broken up into two or more bits and pieces, alienated from one another and even fighting one another bitterly. New frictions cross the continent, perhaps not so obvious as the old ones but excerting an even greater dividing strength instead. The former clear cut into two parts has been substituted by a multitude of floes each of an unknown stability and drifting into different directions.

What is Europe? This question by a Swiss newspaper was answered by young journalists. A Hungarian from Budapest was well aware of his socio-economic distance to most West-Europeans but also of his being better off than the Russian or Romanian tradesman waiting patiently at the Hungarian border and trying to exchange an old tool against something to eat for his starving family. To the Hungarian Europe has fallen into three separate parts and he ponders whether Europe represents Christianity in the Roman Catholic coinage, whether it stands for a specific culture, for a certain level of prosperity, or whether it is nothing but a continent.

A young woman from Marocco and living in Paris on the other hand has been fascinated by the European idea since she was a child. To her Europe stands for more justice, more knowledge, more opening-up to the world; in short: more humanity.

Much less enthusiasm is shown by an Austrian from Vienna. His vision of Europe is rather plain in that he substitutes the ideal of European humanity by the idea of a functional community. To him the vague feeling of cultural identity alone cannot serve as a sound basis for a common future; he prefers the insight that some goals as for instance peace can be reached best by a community.

Extremly different answers to the same question, depending on the person's point of view: is it from the outside or rather from the inside of a dominating community? Answers that are highly uncommon in geographical education, too, which has a preference for definite, assertive answers just as most school subjects have.

2. Disparities in the economic situation

2.1 Employment

The long bisection of Europe will be noticed as a scar for quite some time to come. It will be realized in basic fields as for instance statistics. The successor states to the former Soviet Union started collecting data on the extent of unemployment in the second half of 1991 or even later while the other European members of the former CMEA (Community for Mutual Economic Assistance) began that work some years earlier. The reliability of those data is limited and the figures have to be taken with great care since unemployment is a phenomenon incoherent with the former socio-economic system. Without doubt only parts of the really jobless persons will be represented in the statistics which therefore are hardly comparable to those of West European states. How rudimentary the coverage of unemployment statistics is may be shown with a few examples (cf. Tab. 2.1)

Tab. 2.1 Unemployment Rates September 1992

France	10,3	Albania	. . .
Germany	05,2	Bulgaria	14,8
Italy	09,9	Czech. Republic	02,6
Unites Kingdom	10,5	Slovak Republic	10,6
Austria	03,7	Hungary	11,4
Belgium	08,2	Poland	13,6
Danmark	11,6	Romania	07,6
Norway	07,2	Slovenia	12,2
Finland	14,7	Croatia	18,5
Ireland	16,7	Estonia	02,0
Netherlands	07,0	Latvia	01,2
Portugal	04,2	Lithuania	00,9
Spain	19,5	Ukraine	00,4
Switzerland	03,7	Russia	. . .

Sources: United Nations, Stat. Bundesamt

In April 1993 about 3,4% of the work force in Latvia were registered as un-employed while experts estimated the real unemployment-rate at about 15%. This estimate did not take into account the so called hidden unemployment which is another measure for a low productivity.

In Russia the situation is even worse. Jobless persons do not register with the authorities partly because they are not aware of the institutions, partly because they do not expect any improvement in their situation; partly because they do not want to be regisetred as being unemployed at all.

The disparity in this field turns out to be even greater when the consequences of unemployment are reflected. The "welfare net" in West European states guarantees some sort of social security for those without work however great the differences even between those states my be. In the eastern part of the continent similar institutions are lacking and being jobless often means to be stricken with extrem poverty. This situation is aggravated by a psychological stress since most people lost

their work within a very short span of time without any chance to adapt themselves to the new circumstances. Rather frequently unemployment surged particularly rapidly with the privatizations of large state farms or firms.

2.2 Economic structure

Severe differences occur with regard to the structure of the national economies. All states in the eastern part of Europe as well as the less industrialised in the South and the West of the continent are characterized by a high percentage of their work-force being occupied in the primary sector, while the services are less developed (cf. Tab. 2.2). This is partly due to a low degree in farm mechanisation because sufficient financial means are lacking as for instance in Poland and Greece (To some extent, however, it is the consequence of the economic transformation into market economies with a growing privately owned sector which is underway in the eastern countries. Their problem is that they centralize the macro-economic control by setting up the appropriate situations and learning to use them while at the same time they de-centralize the micro-economic decision making. This systemic reform is bound to cause major social shocks and it is doubtful if emergency stabilisation programmes can cushion the harsh effects.

Tab. 2.2   Economically active population by industry (1991)

	Agriculture Forestry	Producing	Services industries
Estonia	12,4	43,8	43,8
Latvia	17,7	35,9	46,4
Lithuania	17,8	39,9	41,0
Ukraine	19,6	40,1	40,3
Russia	13,4	42,8	43,8
Hungary	15,3	40,4	44,3
Poland	27,6	35,5	36,9
Romania	27,9	38,0	34,1
Bulgaria	19,3	46,3	43,4
CSFR	11,5	36,5	42,0
Germany	02,4	42,5	55,1
Belgium	00,4	33,3	66,3
Danmark	02,6	28,1	69,2
France	01,4	31,8	66,8
Greece	01,6	34,1	64,3
Great Britain	01,2	30,8	68,0
Ireland	02,7	33,9	63,4
Italy	04,7	37,1	58,1
Luxemburg	00,7	31,0	68,3
Netherlands	01,9	27,4	70,7
Portugal	04,1	41,7	54,2
Spain	05,2	37,8	57,0

Sources: Stat. Bundesamt 1993, 1994

2.3 Living standard

With rising unemployment and an accelerated inflation, with falling output and productivity the living standard of the population in the eastern countries of the continent is bound to decline. In this respect the eastern countries are worse off than the less advanced members of the European Union that can draw on the large resources of the community. Understandable, that the eastern countries are hoping for a helpful trade and cooperation agreement with the EU, which on her side has barely begun to come to terms with the connected implications. Tab. 2.3 reveals the existing disparities with regard to a few consumer goods. Obviously those items are spread easier which are not fully dependent on the quality of the existing infrastructure as for instance the use of cars. The correlation is greater when considering the use of phones that require an extended network.

Tab. 2.3 Distribution of selected consumer goods (per 100 inhabitants)

	cars	phones
Estonia	18,6 (1992)	24,4
Latvia	12,2 (1991)	28,6
Lithuania	13,7 (1991)	23,2
Ukraine	06,9 (1991)	13,4
Russia	05,9 (1990)	15,9
Hungary	18,8 (1990)	09,6
Poland	13,8 (1990)	08,5
Romania	55,7 (1990)	12,5
Bulgaria	23,5 (1989)	14,1
CFSR	20,7 (1990)	27,5
Belgium	35,5 (1989)	37,6
Danmark	54,4 (1989)	31,1
Germany	46,4 (1989)	48,2
Greece	36,1 (1989)	14,9
Spain	28,1 (1989)	29,5
France	45,6 (1989)	39,5
Ireland	23,6 (1989)	22,1
Italy	35,0 (1989)	42,4
Luxemburg	44,1 (1989)	47,3
Netherlands	43,8 (1989)	35,0
Portugal	17,8 (1989)	22,7
Great Britain	42,8 (1989)	36,6

Source: Stat. Bundesamt 1993, 1994

2.4 Wages

Wages are **the** opportunity the less industrialized countries want to make the most of. The money for which a qualified worker in Germany works one day his counterpart in Poland, Hungary, in the Czech and Slovak Republik will earn in two weeks'time. The situation is similar in Portugal and Greece. In the Ukraine and in Russia he will have to work even longer: one month. In Estonia a seamstress will

earn about half a German mark per hour while in Germany she will get about DM 15.60, more than 26 times as much although it is regarded as an extremly low wage in Germany. Having no long distances in between them both workers have to compete with one another and it is quite clear who will come in first. Even a lower productivity does not make any difference and so it is quite understandable that about one third of the German enterprises plan to transfer at least part of their production into low-cost-countries. The consequence will be a loss of jobs. If all plans materialize they may sum up to about 250.000 jobs and more. No wonder that trade unions try to stop the growing free trade in Europe with all means by pointing out the social and environmental disparities, calling them social and environmental dumping. Their claim: to raise the respective standards to a common level and thereby establish the basis for a "fair" competition.

3. Disparities as economic support

Low wages are basic to a sustainable economic development in the less industrialized states in Europe. They are the only means to attract industry and services and to develop a substantial market of their own. It is not likely that wages will reach the same level throughout Europe within the next ten years.

The condition for a successful development is an open-door policy that allows the products to enter the EU. As mentioned before this policy will cost jobs, but it will create new ones at the same time. All experience with free trade shows a substantial gain on all sides due to a conversion of the labour force from agriculture to industry, from Low-Tech to High-Tech-products from industry to services. The reason for this development is quite clear: the new market in the developing countries consume more products as before.

Free trade leads to efficiency not only with regard to wages but also with regard to the use of energy and resources. It is ecologically meaningful to establish industries with a high energy demand in those countries that own rich energy reserves. And it may make good sense to grow agricultural products in those regions that own the better natural outfit. A natural limitation is given when long distance transports reverse the benefits of making an intelligent use of a disparate environment.

4. Solidarity: Overcoming disparities

Disparities are the result of natural or historical situations and developments. Often they come into existance by a person's or a group actions and they can be overcome the same way. The starting point for school in general and geographical education in particular is to acknowledge disparities as much and to search for the reasons for their existance. The next step is to find ways and means to overcome them. The third and most important step: to act accordingly.

Most frequently we deal with questions or problems in a rather theoretical way. In doing so we keep a secure distance and avoid any obligance. This behaviour must be broken up. We must get involved in the matter, we must feel empathetically with those on the other side of disparate connection and start efforts to improve their situation. The basic insight is that in giving away some of our welfare we gain in understanding and in peaceful cooperation and coexistence. The difficult task is to reveal the egocentric motives in an altruistic behaviour. To give an example: the transfer of jobs into regions with high unemployment will be compensated by cheaper products which can be afforded by more persons and contribute to the economic

growth in all regions by higher demand e.g. tools for the manifacturing of the initial products.

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ODER AND NEISSE: JOINING OR DIVIDING EUROPE?

Gertrude Rohwer

The Oder-Neisse Border: Barrier or Bridge

After the end of East-West confrontation in Europe, the break-up of the Soviet Union, the Warsaw Pact and Comecon, and the raising of the Iron Curtain at the intra-German border, a new orientation is called for in Europe, both in politics and in individual attitudes.

A major element of West European and North Atlantic integration policy after World War II was the existence of the "Eastern Bloc", walled off from the West by the barrier constructed along the intra-German border. The citizens of the old Federal Republic turned their backs on the East; their cultural interests and political values were oriented more towards the west, north and south. In the former GDR and other eastern Central European countries, the citizens' orientation was divided. As the ruling regimes became increasingly more rigid, the younger, more consumption-oriented population in particular undermined the state-decreed "friendly relations" with the "socialist brother countries".

The Eastern Bloc has fallen apart. The former GDR is part of a united Germany, the EU and NATO. The new border between east and west runs along the so-called Oder-Neisse Line. But it no longer separates "blocs". In the West the intergovernmental systems of alliance and cooperation still work as they did before. To the east of the Oder and Neisse, however, the collapse of the system is being followed by military, political and socioeconomic instability. The first signs of increasing stability are the move towards democracy and market economy in the "reform countries" of Poland, Hungary, the Czech Republic and Slovakia.

How should the West, the western Europeans, and particularly the Germans react to these radical changes? How do politicians, businesspeople and the men-and-women-in-the-street deal with this new situation, what new points of view are opening up at an individual, regional, national and international level?

Hopes for a new peacekeeping strategy in Europe, for freedom and economic prosperity for the eastern neighbours too, clash with fears of resurgent hegemonial thinking in Russia, of the unpredictable consequences of ethnic-nationalistic conflicts, of legal and illegal migration of labour associated with economic transformation and wage disparities, fears of cheap agricultural imports, for example, with which domestic farm products cannot compete. The media are full of news items about car thieves, cigarette smugglers, slave-traders, bands of thieves from eastern Europe, all of which increase antipathies in Germany - and especially in the border regions - towards a more open frontier with the east.

Would closing the borders allay such fears? Perhaps - but Timothy Garton ASH (1994), one of the foremost experts in contemporary history, does not believe that it would solve future problems in eastern and western Europe. In his opinion, the EU should grasp the chance offered by the creation of large new economic blocs in

The Polish-German Borderlands
Proposed Regions of Transborder Cooperation

Population in cities and towns

- more than 1 Mio
- up to 1 Mio
- up to 500 000
- up to 100 000
- up to 50 000
- Motorway
- Main road
- Railway
- Waterway
- National boundary
- ⊖ Check-point
- Boundary of „Laender" or „Voivodships"

Proposed Euroregions

1	„Pomerania"
2	„Pro Europa Viadrina"
3	„Spree-Neisse-Bober"
4	„Neisse"

0   50 km
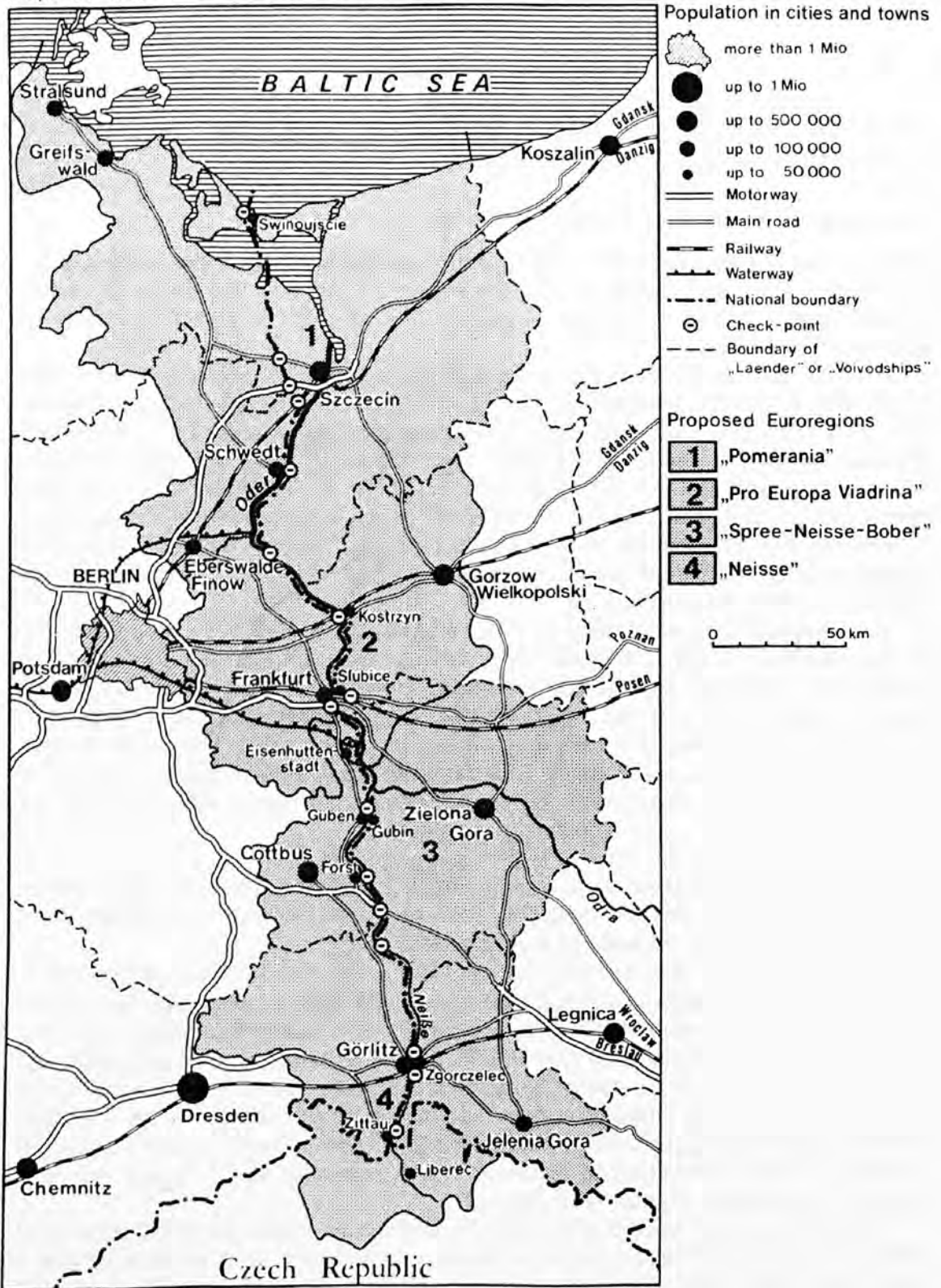
America (NAFTA) and Asia (APEC) to expand eastwards and found NEFTA, a New European Free Trade Area, in order to secure economic progress in both eastern and western Europe.

Prior to unification, West German policy tended to emphasize the link between the future development of Germany and that of Europe, maintaining that the division of Germany was the cause of a divided Europe, and that to overcome this division would in turn abolish the division of Europe. Now Germany is unified, but to create a unified Europe - a hitherto unknown entity and the subject of much controversy - remains a task for the future.

At the Oder-Neisse border we can observe the process of European reconciliation, with all its major obstacles and minor advances, at various levels and scales.

Recognition of the Border

With the unification of the two German states in October 1990 the new Federal Republic of Germany gained a new eastern border. In the old Federal Republic, recognition of the "Oder-Neisse Line" as the western border of Poland and the eastern border of Germany reactivated the bitter controversy raging at the time of the treaties with the Eastern Bloc states in 1972, when the expellee associations attempted to enforce their claim that this border was "historically unjust". However, if the German government had refused to guarantee the Polish-German border the Four Powers would not have consented to German unity in 1990. The international importance of German recognition of the Oder-Neisse border - and, in effect, the degree of international mistrust of Germany - was shown by the fact that before unification on October 3, 1990, the Two-plus-Four Treaty was signed on September 9, 1990, by the Foreign Ministers of both German states and the four Allies in lieu of a peace agreement. This treaty established that Germany, as a consequence of the war it had begun and lost, recognized the Oder-Neisse border, and therefore had to cede some 25% of its 1937 territory. This proviso was also formally incorporated in the Polish-German border treaty of November 14, 1990, setting the seal on the inviolability of the Polish borders. This put an end to the perennial controversy in the Federal Republic about ceding the former German territories to the east of the Oder and Neisse. The foundations were now laid for the process of rapprochement and reconciliation between Germans and Poles, and the first possibilities of bridging the border glimmered on the horizon.

Re-Assessing the Border

While the 1990 discussions considered the recognition of the Oder-Neisse border to be largely a national problem, the recent political developments in eastern Europe have lent it a new dimension extending far beyond its importance as an interstate border.

In early 1994 the Oder-Neisse border separated
– at an international level: the countries belonging to the NATO security treaty from the security vacuum that arose after the dissolution of the Warsaw Pact,
– at a European level: the economic area of the European Union (EU) and the EFTA from that of the Comecon system, which broke up in June 1991.
– at a national level: self-reforming Poland from a Germany preoccupied with unification.

- at a local level: towns and countrysides that had shared a common history prior to 1945 and afterwards had been situated in the peripheral border regions of Poland and the GDR, well away from the dynamic economic centres.

At all four levels there are factors that permit both a closing and an opening of the borders.

While in the West scenarios are being developed depicting a "Start to a new Europe", a "Europe Without Frontiers" and a "Europe of the Regions", an ambivalent process is taking place at the Oder-Neisse border aiming on the one hand to close the border, but also to open it, with no signs of a clear perspective.

Partnership for Peace

The eastern Central European reform countries of the former Eastern Bloc are in favour of a rapid rapprochement to, and membership in, NATO in order to satisfy their need for security in relation to Russia and the CIS countries, especially after the success of Zhirinovsky in the Russian parliamentary elections in December 1993. His remarks about a joint German-Russian border caused not only Polish blood to run cold.

At the NATO summit in Brussels in January 1994 an offer of "Partnership for Peace" was made that contained neither security guarantees nor a timetable for membership. Such an offer was of course a disappointment to the governments of Poland, Hungary, the Czech Republic and Slovakia, it being also addressed to Russia and the other former Soviet republics.

With the headline "Partnership for Peace proves the West's Indecision" the Czech newspaper "Mlada fronta dnes" commented:" The projected "partnership" is an unsatisfactory substitute in the present situation. It merely shows the pettiness of today's western leaders. In the metropoles of western Europe much is said about extending the stability zone, which basically means moving western democracies as far eastward as possible. For more than four years now, the countries of Central Europe have been building their new social systems on a democratic pattern. For more than four years now, the West has had the historic opportunity to extend its protected reserve at least as far as the Ukraine. But it ought to show enough willpower, willpower that it has lacked and still is lacking in Bosnia, Moldavia or Georgia. Over the past year the West, eye to eye with imperial Moscow, has lost all the former Soviet republics except for the Baltic states ... Membership of NATO for the Visegrad countries (Poland, Hungary, Slovakia and the Czech Republic) or at least a clearly specified offer of it would be a gesture of support, an intervention of peace, that would permanently link Central Europe to the West. Partnership for Peace represents merely humanitarian aid, which - as in Bosnia - only lengthens the period of apprehension." (Frankfurter Allgemeine Zeitung, January 12 1994, transl.).

In this decision, the NATO members followed America's interest in binding Russia into a pan-European security structure which is to be oriented towards Moscow's interests as well. "For European security, the success of democratic forces in Russia is more important than NATO's expansion eastward. But if the reformers in Moscow fail, the next NATO summit will be faced with difficult decisions." (FELDMAYER 1994, p. 1, transl.).

President Clinton's remarks in Brussels that the NATO could not afford to "draw a new line in Europe further east" shows that the Oder-Neisse border will remain the eastern boundary of the NATO security alliance for an indefinite period.

The countries of eastern and east Central Europe are already collaborating in the NATO Cooperation Council founded in 1991 and in the North Atlantic Assembly, but "Partnership for Peace" does not offer more than immediate consultations in case of threat, and the proposal of joint exercises and coordinated training for participation in international peace missions.

One important aspect of Poland's entry into NATO has been emphasized by the US security expert Ronald D. ASMUS: " For Poland, for example, NATO membership also means that NATO troops will be stationed there ... Such an integration will not be possible without the presence of German troops in Poland. Relations between Germany and Poland will be the political acid test for the entire process of NATO expansion." (Neue Zeit, February 12 1994, transl.). On Februar 2, 1994 the Polish prime minister Pavlak signed the basic agreement for "Partnership for Peace".

Does the EU end at the Oder?

Poland's interest in joining the EU meets with a European Community that is presently occupied in intensifying relations between its member states and in extending the European Economic Area to include the EFTA states, instead of concentrating on a large-scale expansion towards the east. The main obstacle is considered to be the existing east-west differential in productivity and living conditions. The relatively less-developed EU partners are afraid of competition from the east. The low wage level of qualified skilled workers, the production of cheap mass-produced goods, and access to EC funds could reduce the competitiveness especially of the southern EC partner states.

"At the moment, we have a shameful protection, whether against Polish textiles, Czech steel or Hungarian foodstuffs. We send those countries countless advisers to preach the virtues of the free market and free trade, but we do not practise what we preach. They are told that they can hope to join the European Union only if they transform their economies, but they are denied the market access that only would sustain that transformation." (ASH 1994).

Since the Association Agreements with the EU came into force on February 1, 1994, Hungary and Poland have become associate members of the EU. From 1995 onwards they will be able to export all industrial products except steel and textiles duty-free to the EU market; from the end of 1999 onwards, export duties will no longer be levied by the domestic market. Within the next ten years, the free trade zone is to come into force. However, the Association Agreements do not represent the EU's legally binding consent to future membership.

When the Schengen accord comes into force - probably in late July 1994 - and the EU puts its "open barriers" policy into practice, the countermove will be to raise the barriers at the Oder-Neisse border again. In order to meet its obligations at the EU external border, the Federal Republic has already increased the number of customs and border police personnel and improved their equipment. Some 4000 officers are deployed at the borders with Poland and the Czech Republic to track down illegal immigrants. At present they are equipped with 22 mobile infrared search devices mounted on Volkswagen vans, and a further 83 are to follow.

This "electronic fence" method is expected to multiply the number of illegal immigrants caught and so counteract the unwillingness of the EU member countries to open further crossing-points at this specific border. In July 1993, a bilateral agreement was signed regulating the deportation of persons illegally entering Germany

and of potential applicants for asylum, by which Poland undertook to admit rejected asylum-seekers. Since the majority of illegal entrants are Rumanians, Bulgarians and citizens of the CIS countries, the Federal Republic has agreed to pay Poland 120 million DM in 1993 and 1994 to create the infrastructure necessary to admit rejected asylum-seekers and to improve its own border protection facilities.

Borders should become Bridges

In a programmatic speech during his visit to Poland in May 1990 the President of the Federal Republic, Richard von Weizäcker, referred to the future importance of the Oder-Neisse border. "The present western border of Poland will remain inviolate. We respect it, and now and in the future we will make no territorial claims on Poland (...). But the same is true of Poles and Germans as of Europe as a whole: we do not aim to recognize borders, the better to separate countries. On the contrary: borders should lose their separative character. Borders should become bridges. We don't want to pull down the Berlin Wall in order to rebuild it at the Oder and Neisse. (...) If we want build such bridges we should not give way to effusive emotions but perceive hindrances rationally and take advantage of opportunities considerately. We are aware of the cordial hospitality that people offer each other, but we are also aware of the existence of fears and defence reactions. Many Polish people are afraid that the Germans will push eastward again and are scared of being bought up. On the other hand, not every German is happy about the many Polish commercial and economic tourists." (Der Tagesspiegel, 3 May 1990, transl.)

With the signing of the Polish-German agreement on good neighbourliness and friendly cooperation on 17 June 1991 a start was made towards a lasting understanding and reconciliation between Poland and Germany and towards developing the ties between eastern and western Europe. The inviolability of the borders was emphasized once more and a wide-ranging cooperation between the countries was agreed upon. These treaties were ratified in October 1991. In the meantime various bilateral agreements form a solid foundation for cooperation between Germany and Poland: a Polish-German government commission on the regulation of regional and near-border cooperation and a Polish-German youth organization were created. A German-Polish economic development association will be established in 1994.

From "state-decreed brotherhood" to "voluntary cooperation"

In the 1960s and 1970s the GDR and Polen made some attempts at transborder cooperation, e.g. joint ideas on developing tourism in the Baltic region and on urban development in the towns of Frankfurt an der Oder/Slubice, Guben/Gubin, Görlitz/Zgorzelec. However, as a result of Solidarity's struggle for Poland's freedom these contacts were largely broken off and are now having to be laboriously rebuilt.

"This border is visible: People don't go for a walk and find themselves unawares and unnoticed in another country. Here you need the will to cross bridges, proving your identity in the proper manner. Bridges across the Oder and the Neisse are not very numerous and the few that exist concentrate the growing streams of traffic, much to the annoyance of the border towns. Bustling business activity drives the Germans to the nearest Polish market, to the nearby shops, to the most accessible petrol station. For many it's the low prices that make their neighbouring country attractive. Petrol, cigarettes etc are an irresistible enticement and trigger a borderland tourism of astonishing proportions, for trading purposes a two-way traffic. Most Polish towns managed to master this trading activity quite rapidly, organized bazaars

let the taxi drivers profit from shopping sprees and the police from parking fines. This small-scale - not always legal - exchange of goods may be lively, but the region is poor in transborder economic relations, in cultural exchanges. Rainbow-coloured and glittering, however, are the visions of a blooming, mutually productive German-Polish Oder region.

Shaken by the political changes, the German east would like to be the gate to the European east, the Polish west sees itself as the most important corridor in this east-west link, and its power to stimulate the economy is the joint hope of both countries." (SACHERS 1992, p. 4, transl.)

The Minister-President of Brandenburg and the Wojewoda of Szczecin developed far-reaching visions. They called for the border to be devalued to a customs frontier and for support for a new, transborder, integrated economic structure in an up-to-100 km broad strip on each side of the border, this being the only way to prevent the growth, on both sides of the frontier, of a new "zonal" border area likely to become the poorhouse of Europe. Its inhabitants would be able to work legally on the other side of the border, to open shops and found companies, and to claim tax relief. Perhaps the region would then attract investors.

For the time being, these visions will remain dreams of the future, there being political and economic reservations at both local and national levels: many Poles are afraid of a renewed German attempt to colonize the east, many Germans fear that their income structure will be undermined by Polish wage-dumping.

From the Polish-German borderlands to a Polish-German economic region

At present the border region is largely a transit area. In 1993 almost 150 million people crossed the border between Germany and Poland (34 millions in 1991). Thirty-six million cars and 1.4 million trucks passed the checkpoints. Germany was Poland's most important trade partner, with 28% of Poland's entire foreign trade falling to Germany and another 32% to the other EU member countries. Poland imported German goods (mainly machines, vehicles, yarns and fabrics to the value of about 10 thousand million DM, a 20% increase over 1992). Goods were exported to a total value of about 8.5 thousand million DM, mainly clothing, construction materials, copper and copper alloys, bituminous coal and furniture. Another 1 thousand million DM were paid for services rendered, mainly for work contracts. After trade with east German companies more or less collapsed, about 90% of Poland's foreign trade is being carried on with west German partners. This relatively intensive trade commitment contrasts with the low level of German investment in Poland (about 400 million DM). This is all the more surprising as labour costs in Poland are considerably lower than in Germany. US and Italian companies have invested more than 1 thousand million DM respectively in the Polish economic centres of Posznan, Szczecin and Wroclaw. German firms prefer to employ Polish workers in Germany. In 1993 they hired 35,000 contract workers and about 160,000 seasonal workers from Poland. Nevertheless, the number of Polish workers involved in the legal German labour market is low, even in the areas near the border. How many Polish workers are employed illegally is difficult to judge. Statistics issued by the Joint Task Force on Illicit Labour show that 720 checks were made in Berlin in 1992 and proceedings taken against 732 employers employing 5283 foreign workers, 1597 of whom were Poles. However, some 15-20,000 illegal workers from eastern and east Central Europe are presumed to be employed in Berlin. In Poland, markets

at all the border crossings (with as many as 2500 stalls) have developed into an important economic factor. Estimates suggest that in 1993 German customers purchased mainly Polish-produced goods to the value of 2-3 thousand million DM! This currency flow resulted in a positive Polish balance of trade with Germany, increased the tax revenues of the market districts, strengthened the sales of Polish products from the hinterland and reduced unemployment in the border region.

At the few, badly equipped crossing-points along the more-than-450-km long border, the growth in German-Polish trade activity is mainly visible in the shape of kilometre-long queues of traffic. Truckdrivers have to reckon with holdups of up to 48 hours, and cars are often delayed for several hours too.

Especially on the German side of the border, industry and agriculture are having to combat restructuring problems in the border area, the Polish-German borders being a sort of "double periphery". Even during the Comecon era they were situated at the margin of the large agglomerations and economic centres. Typical features were monostructural industrial sites such as Schwedt and Eisenhüttenstadt, a high proportion of agricultural employees, and a poorly developed service sector. With few exceptions, this situation has hardly changed, let alone improved, since 1989. De-industrialization, the loss of young and qualified labour, depopulated villages, and the rapid decline of agriculture are appreciably diminishing the locational advantages of the eastern German border regions.

In order to stop the peripherization process, the Germans in particular are interested in stimulating transborder growth. At the local level, one important development instrument to overcome the marginal location and the restructuring problems in the border areas on both sides of the Oder and Neisse is considered to be the creation of Euroregions. At the administrative level, this transboundary system of organizing communes and districts provides the necessary transborder cooperation basis to implement joint projects in order to solve urgent economic, social and ecological problems. In addition it supplies the organizational and administrative structures required to build up a regional EU development programme. Political and economic realities, however, are impeding the creation of German-Polish Euroregions at the external boundaries of the EU. Neither the national governments nor the EU have provided adequate funding. Up to now no aid has been made available for joint Polish-German projects. As a matter of principle, money from the Regional Fund could not be spent outside the EU. Recently it was agreed to use 300 million DM of the 1 thousand million ECU (2 million DM) PHARE budget to finance transborder cooperation. It is still not clear how the new funds are to be divided among the various projects. What is clear, however, is that they will be subtracted from the funds designated for restructuring the economy of the eastern neighbouring countries. The German border regions will reap the benefit, since their share of funds for transborder projects will now be paid out of this budget and not out of the available resources of the EU Regional Fund. It is now obvious why reservations have been expressed in Poland against transborder projects. In spite of these reservations, three Euroregions have already been established on the Oder-Neisse border, a fourth is at the planning stage.

Europe's Future at the Oder

To date, all the transborder projects of the Euroregions are at the planning stage. Only the infrastructure measures to develop the motorways and to improve border

clearances are already being implemented. But at the "lowest" level interest groups are not letting themselves be discouraged by young right-wing radicals beating up Polish people in Schwedt and Frankfurt an der Oder and are already working on German-Polish school projects (e.g. in Frankfurt an der Oder, Guben, Schwedt and Gartz), as well as cultural circles and vocational training. However there are still many antagonisms to be overcome in the future.

"The political and ideological division of Europe is now a thing of the past. Europe is one Europe already. But the civilizatory and economic division does not yet belong to the past. The strength of this division represents a threat to the security and the future of our continent ... The decisive question is whether our thinking has already changed radically in pan-European categories or whether we still think in categories of Western and Eastern Europe." (MAZOWIECKI 1993, p. 449 f., transl.).

When and how is German-Polish reconciliation, friendship, understanding possible? TYCNER points out that in contrast to all the euphoric declarations by politicians and advocates of European integration, it is necessary to view the situation realistically. "Whoever does so, cannot avoid anticipating a long period of normalization. Anyone wanting to apply Franco-German understanding to the German-Polish situation, should remember that Poland, unlike France, has very little or no attraction for most Germans. This applies to both the culture and the way of life, the food, admiration of the language. Apart from Poland's lack of appeal in German eyes, the biggest problem is probably the lack of equality, the constant confrontation of superior German strength with excessive Polish weakness. This inequality attracts and repels at the same time. We speak completely different languages, generally behave quite differently, our pride stems from quite different roots, our sensitivities are different, not to mention the differences in our standard of living. Such unequal neighbours cannot suddenly live together in harmony after years of confronting each other in hate, contempt, at gunpoint." (TYCNER 1992, p. 7, transl.)

The Oder-Neisse border region as a topic in geographical education

The present and future fashioning of neighbourly relations between Germany and Poland in the context of European unification, and the possibilities of transborder cooperation are worthwhile topics for geography lessons. However, the teacher should not focus on the problematic historical roots of the Polish-German relationship but on the present situation in the peripheral, underdeveloped regions on both sides of the border, and on developing a "concrete Utopia" for the future.

The opening of the Oder-Neisse border is both simple and complicated at the same time. The border does not only separate two sovereign states with different legal and administrative systems but rather it is a wealth or poverty line, marking the difference in income between the western and eastern parts of Europe. In addition the post-1945 population resettlements have made the border into an unmistakeable boundary between languages. Since 1991 this boundary has become more permeable, bringing benefits to some and disadvantages to others. For example, the markets on the Polish side of the border have created sources of income for those Polish citizens hit by economic restructuring in Poland, and they provide cheap shopping opportunities for those Germans hit by economic restructuring in Germany. The users are in favour of the markets, the shopowners on the German side of the border are of course against them! When Polish citizens work in Germany for low wages, either legally or illegally, German employees are against it, German employers in favour.

This ambivalence in evaluating transborder activities should be used to stimulate class discussions. The students can also think about their own "secret boundaries". Setting boundaries, including and excluding others, crossing boundaries, opening up boundaries, integration and segregation are also part of the direct social experience of the students. Hostility towards foreigners and radical nationalism are one side of the coin, education for peace and international understanding are the other.

Discussing the topic of "borders" in geography lessons may itself be crossing borders, since traditional regional geography often regards frontiers as the given limits of the areas to be studied. School atlases use the same boundary symbol for all national borders, although these borders may be quite different in character and may also change in the course of time. Remember the internal and external borders of the European Union, for example. If geography teaching remains "standing at the border", it will miss transnational interrelationships and the "one-world dimension". "We are used to thinking in terms of regions, but as teachers we also have to think of 'opening borders'." (GRÜNEWÄLDER 1992, p. 9, transl.)

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TERRITORIAL IDENTITY
AND TERRITORIAL ORDER IN EUROPE

Hartwig Haubrich

Abstract

This paper contains in a first part a preliminary report about an empirical "European Awareness" Research Project, i.e. about the local, regional, national, European and global identity of university students in many different European countries. One of the main outcomes is the low appreciation of Europe in every country on the one hand and often a strong global and local identity of many national subgroups on the other. The second part of this paper delivers some thought about a New Europe, which combines the territorial identity with a new territorial order in Europe, i.e. to abandon the universal nationstate and to build different functional communities in Europe.

Research Reasons

Current political affaires and experiences in Europe as nationalism, regionalism, war, migration and multicultural challenges but also efforts to unify Europe somehow under a roof of the so-called "European house" make it necessary to measure the attitudes, fears and hopes of Europeans, i.e. their self- and neighbour perception and their territorial identity as well.

Research Aims

The above mentioned reasons lead to the following research aims:

to explore: 1. the local, regional, national, European and global identity
2. the perception of neighbour- and other nationalities in Europe
3. the national self-images
4. the individual value-orientation

of university students in different - if possible all - European countries.

Target Groups

There are two reasons to concentrate this research project on university students:
1. University students normally belong to the critically thinking part of a society and

it can be expected that they get into key positions in their society after their study and that they will have a strong impact on their societies as the main opinion leaders and decision makers. The future - also the future of Europe - will be strongly determined by the current university students. Therefore it is necessary to know what they feel, believe, fear and hope.

2. The author of this report is the current chairperson of the IGU Commission Geographical Education and therefore he had the opportunity to cooperate with many colleagues in nearly every European country. These colleagues and friends have been so kind to find students who were ready to fill in the nearly 10.000 questionnaires (see Appendix I, II) Without such personal relations it would have been impossible to get this broad international survey on the way.

Research Hypotheses

The theoretical fundament of this empirical project is published in: Haubrich, Schiller, Wetzler (1990) Regionalbewußtsein Jugendlicher am Hoch- und Oberrhein. Freiburg. This concept is the basis to the formulation of the following hypotheses:

1. Space reference (spatial identity) can only be described by the relational structure of the attitudes to different spaces. The aim is to describe the main forms of the different structures.
2. National self- and alter-images can only be interpreted through the comparison of the self- and alter-images. The self-images show the value hierarchy of the society, and the differences between the alter-images and the self-images articulate nearness and farness.
3. Self-images of the different national groups are in relation to their comparibility also indices of nearness and farness of the different societal-cultural systems.
4. Differences between national self- and alter-images or between the own national self-images and the self-images of other national groups must not be identical.
5. We expect the self- and alter-images to appear in two groups of images: images according to the mode 'human beings as you and I' or 'human beings of clearly different orientations'. This classification can be defined on the basis of national self-images.
6. Personal value hierarchies defined the nearness or distance to the society's norm in the kind of national self-images. Homogeneity or heterogeneity of national self-images and personal value hierarchies show also the state of a society.
7. We expect to find comparable self-images of different nations (multinational value hierarchies).
8. We expect to find intercorrelations between space preferences and self- and alter-images.
9. We expect clusters of comparable identity groups in different countries.
10. We expect to be able to describe basic forms of attitudes through both attitude instruments (spatial identity and self-/alter-image). The distribution will differ in the different countries.

This report treats just the hypotheses 1 and 9.

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Research Methods

The above research aims but also the many students to be asked in so many European countries made it necessary to work with questionnaires (Appendix I, II). Some pilot studies and the use of a similiar questionnaire in a trinational project (Haubrich 1990) with 6000 students proved that this questionnaire doesn't produce any problems. Nevertheless the questionnaire had to be translated into many different languages. Therefore we asked the coordinators to translate the German or English version into their mother language. Additionally the outcomes were proved by professional language experts of the German Max Planck Research Institute in Freiburg. Nearly 5000 filled-in questionnaires from 21 countries are the basis of this preliminary report. The data were processed by SPSS. The identity averages of the raw data of every nation (Appendix III) showed very clearly the low appreciation of Europe nearly everytime, but it was also clear, that averages of raw data hide the groupings behind the means. Therefore we processed a Z-transformation in order to find the individual anchors of every single student; and in order to discover the different identity groups we worked out a cluster analysis. Because of the shortage of space the following figure shows the outcome just of one example with the concrete numbers.

fig. 0 Identity: Belgium/Fl

Cluster	1	2	3	4	5
Nat	0,26	0,31	0,10	-0,98	-0,12
Ep	-1,45	-0,72	-0,34	-0,69	0,24
Eg	0,03	-1,14	0,15	-0,33	0,20
Reg	0,17	0,76	0,36	0,37	-0,44
Loc	0,14	0,89	0,82	0,87	-0,82
Glob	0,85	-0,10	-1,10	0,75	0,93
%	20	24	16	21	18

Key: Nat = National, E = European (p = political, g = geographical)
Reg = Regional, Loc = Local, Glob = Global
(See transition into fig. 1)

To make the numbers readable, the figures were translated into identity types with special names for every single country (fig. 1 - 21). Later the results were summarized as identity classes in an overview about all analysed countries (fig. 22).

Research Results

The figures 1 - 22 are the basis for describing the results, i.e. for characterizing different identity clusters, groups or types. The questionnaire offered 6 different choices of identity as the local, regional, national, European (political), European (geographical), global identity. The cluster analysis is therefore an analysis of a 6-

fig. 1 Identity: Belgium/Fl

Cluster	1	2	3	4	5
++	Glob	Loc	Loc	Loc	Glob
+		Reg		Glob	
–		Ep		Ep	
– –	Ep	Eg	Glob	Nat	Loc
%	20	24	16	21	18

fig. 2 Identity: Germany-East

Cluster	1	2	3	4	5
++	Reg	Glob	Glob	Glob	Nat
+	Loc	Loc	EG	Loc	Reg
–		Eg	Ep	Nat	Eg
– –	Ep	Ep	Nat	Ep	Glob
%	32	15	21	28	4,3

fig. 3 Identity: Germany-West

Cluster	1	2	3	4	5
++	Glob	Loc	Loc	Glob	Eg
+	Loc	Reg	Reg/Nat	Reg	Nat
–		Ep	Eg	Ep	Loc
– –	Ep	Nat	Glob	Nat	Reg
%	44	19	11	11	14

fig. 4 Identity: France

Cluster	1	2	3	4	5
++	Glob	Reg	Reg		Glob
+		Loc	Nat	Reg	
−	Reg	Eg	Loc		Nat
− −	Loc	Ep	Ep	Glob	Eg
%	21	23	18	13	25

fig. 5 Identity: Great Britain

Cluster	1	2	3	4	5
++	Eg	Glob	Nat	Loc	Loc
+	Ep		Reg	Reg	Reg
−	Reg	Ep	Loc	Eg	Ep
− −	Loc	Reg	Ep	Ep	Glob
%	11	17	13	33	26

fig. 6 Identity: Ireland

Cluster	1	2	3	4	5
++	Glob	Nat	Nat	Nat	Glob
+	Eg	Loc			Nat
−	Ep	Ep	Glob		Ep
− −	Nat	Glob	Loc	Ep	Eg
%	0,1	35	18	14	24

fig. 7 Identity: Italy

Cluster	1	2	3	4	5
++ +	Glob	Loc Nat	Loc	Reg Nat	Nat Ep
− −−	Ep Reg	Glob Ep	Ep Eg	Ep Eg	Loc Glob
%	19	22	22	20	16

fig. 8 Identity: Luxembourg

Cluster	1	2	3	4	5
++ +	Ep	Reg Ep	Glob Nat	Eg Reg	Loc
− −−	Loc Reg	Nat Eg	Reg Ep	Ep Nat	Eg Ep
%	11	2,1	19	7,4	66

fig. 9 Identity: The Netherlands

Cluster	1	2	3	4	5
++ +	Nat	Glob Eg	Glob Nat	Nat Glob	Loc
− −−	Glob	Ep Loc	Reg	Eg Ep	Eg Glob
%	26	9,4	21	21	23

fig. 10 Identity: N-Ireland

Cluster	1	2	3	4	5
++	Reg	Glob	Nat	Glob	Loc
+	Loc		Loc	Loc	Nat
–	Ep		Eg	Eg	Eg
– –	Nat	Loc	Glob	Ep	Ep
%	11	8,8	19	16	45

fig. 11 Identity: Austria

Cluster	1	2	3	4	5
++	Loc	Nat/Reg	Glob	Glob	Loc
+	Glob	Loc	Eg		Eg
–	Eg	Glob	Reg		Ep
– –	Ep	Ep	Loc	Ep	Glob
%	31	18	15	20	16

fig. 12 Identity: Poland

Cluster	1	2	3	4	5
++	Glob	Nat	Reg	Loc/Reg	
+	Loc	Reg	Eg	Nat	Ep/Glob
–	Eg	Loc	Nat	Glob	
– –	Ep	Glob	Ep	Ep	Reg
%	27	13	14	33	13

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fig. 13 Identity: Romania

Cluster	1	2	3	4	5
++ +	Loc Reg	Loc Glob	Reg	Eg Nat	Nat Reg
– – –	Glob Ep	Eg Ep	Eg Nat	Glob Reg	Ep/Glob Loc
%	43	32	3,8	11	10

fig. 14 Identity: Switzerland

Cluster	1	2	3	4	5
++ +	Log/Reg Glob	Glob	Eg Glob	Reg	Loc Reg
– – –	Nat Ep	Reg	Ep	Ep Glob	Ep Glob
%	41	15	18	14	11

fig. 15 Identity: Slovac Republic

Cluster	1	2	3	4	5
++ +	Glob Nat	Eg Nat	Glob Loc	Eg Ep	Loc/Reg Nat
– – –	Loc	Ep	Eg Ep	Glob	Eg Ep
%	17	15	36	6,1	25

fig. 16 Identity: Slovenia

Cluster	1	2	3	4	5
++	Glob	Glob	Nat	Glob	Loc/Nat
+	Loc	Loc/Reg			Reg
		Eg		Reg	Glob
– –	Ep	Ep	Glob	Loc	Ep
%	15	26	14	23	23

fig. 17 Identity: Spain

Cluster	1	2	3	4	5
++	Reg	Glob	Eg	Loc	Nat
+	Loc	Loc		Nat	Glob
–	Eg		Ep	Ep	
– –	Ep	Ep	Loc	Glob	Loc
%	44	22	9,3	16	8,4

fig. 18 Identity: Czech Republic

Cluster	1	2	3	4	5
++	Nat	Glob	Nat	Loc/Reg	Nat
+	Eg	Loc		Nat	Reg
–	Loc		Ep	Eg	
– –	Reg	Ep	Loc	Ep	Glob
%	6	28	16	34	16

fig. 19 Identity: Hungary

Cluster	1	2	3	4	5
++ +	Glob Nat	Glob	Nat Eg	Loc Eg	Nat Loc
– – –	Ep	Loc	Reg Loc	Glob	Ep Eg
%	25	12	21	23	19

fig. 20 Identity: Scotland

Cluster	1	2	3	4	5
++ +	Reg Loc/Nat	Glob Nat	Glob Eg/Nat	Nat Eg	Nat Loc
– – –	Eg Ep	Eg Ep	Ep	Loc Reg	Ep Glob
%	39	23	6,8	9,1	23

fig. 21 Identity: Russia

Cluster	1	2	3	4	5
++ +	Glob	Nat	Loc Reg	Glob Loc	Ep/Loc
– – –	Reg Loc	Glob Loc	Eg/Glob Ep	Ep	Glob Nat
%	7	10	41	29	17

dimensional space. We worked out a 6-clusters-system, but this delivered not more than the 5-clusters-system. Therefore we chose the following 5-clusters-order to describe the outcomes. The figures show very strong ++ (> 0,8), strong + (> 0,4), average (0,3 - -0,3), weak - (-0,4 - -0,7), very weak - - (<- 0,8) identities (Compare fig. 0 with fig. 1).

The abbreviations mean: Glob = global, Ep = European (political), Eg = European (geographical), Nat = national, Reg = regional, Loc = local identity. Now it can be seen, that it was wise to differentiate between political and geographical Europe because the students often make a difference between both. Not everytime but often the local and regional identity are more ore less the same. In that case both are taken together as local identity.

1. Belgium/Fl

This questionnaire has been filled in by Flemish students. They show a first group of 20% with a very strong global and very weak European identity. The 2nd group with 24% puts Europe on the last places of their priorities and the local/regional identity on the first places. A next cluster of 16% shows at the end of their value scale a global and at the beginning a local identity. The 4th cluster with 21% contains a combination of a strong local-global identity and of a weak European-national identity. The last group can be described by a very high global and a very low local identity.

Summarizing the results, it can be said, that the Flemish students have 3 groups of together 65% with a weak European identity and that 3 groups show a strong global and local attachment as well, but no nationalist tendencies can be observed.

2. Germany-East

A first group of 32% is characterized by a strong regional-local and very weak European identity. The 2nd cluster (15%) shows a strong global-local and very weak European identity. The 3rd group contains a mixture of a strong global-European and a weak European-national attachment. The 4th cluster (28%) is similar to the 3rd one with a strong global-local and a weak national-European identity. The last small group of 4,3% looks like a nationalist group. Nowhere is Europe at first place, but everytime at last places.

3. Germany-West

The biggest group of 44% is characterized by a strong global-local but a very weak European identity. The 2nd group combines the local-regional identity of the positive side and the European-national reference on the negative side. The 3rd cluster of 11% has its highest priorities in the local-regional-national space and the lowest one in Europe and the world. The 4th group combines its global-regional identity at first places and its European-national attachment at last places. The last cluster has higher priorities in national and international than in local-regional terms.

Summarizing it can be said that just one group has Europe on a first place but 4 groups on last places. The local and global references are of highest importance. East- and West-Germans show more similiarities than differences.

4. France

The first cluster (21%) shows very high global and very low local preferences. The 2nd group (23%) prefers the local dimension and doesn't like the European one. The

3rd group (18%) has a strong regional-national orientation but a weak local-European one. The 4th group (13%) puts the global identity at its last place and the last group (25%) at the first place but the national-European one at last places. Together it can be said: There are no nationalist tendencies, but the regional and global attachment is strong. Threetimes Europe can to be find at last places.

5. Great Britain

The first group of 11% takes Europa at its first places and its local area at last places. The 2nd group of 14% is globally oriented but not regionally. The 3rd cluster of 13% has the nation at first place and Europe at last place. The biggest group of 33% preferes the local area and doesn't like Europe. The last group is similar to the 4th one but additionally with a strong global attachment. By now first time that we have a group with a strong European orientation but the majority shows a very strong local-regional-national identity. Four groups are characterized by a weak European reference.

6. Ireland

The first group shows a very strong global but a very weak national identity. It makes a clear difference between the geographical and political Europe, i.e. geographical yes - political no. This tendency can be observed quite often. It is difficult to interpret this attitude. May be that it means: European Union no - but Europe as a whole yes or the current political situation in Europe no but cooperation in the geographical Europe yes. Of course, this is speculation, but the more positive valuation of the geographical Europe offers some hope.

The 2nd, 3rd and 4th group show the nation at first place and the 5th group at second place. That is the overwhelming impression, but also Europe isn't liked very much.

7. Italy

The 1st group has a very strong global orientation. The 2nd group prefers the local and national orientation before the global and European one. The 3rd group likes the local area but Europe not at all. The 4th group is similar. The 5th group combines a high national and European identity at first places and a local-global orientation at last places. 3-times the nation plays an important role, 4-times Europe can be find at lowest places.

8. Luxembourg

The 1st group has Europe at first place and the region at last place. The 2nd group (21%) has also Europe in a high priority but the political Europe and not the geographical Europe which is at last place. The 3rd group is characterized by a high global and a low European attachment. The next group makes again a clear difference between a high valuation of geographical Europe and a low one of political Europe. The biggest group of 66% likes the local area most and dislikes Europe. This is a surprising outcome in one of the capitals of the European Union.

9. The Netherlands

The 1st group of 26% shows a very strong national identity and very weak global orientation. The next group of 9,4% is characterized by a high global and a low local identity. Geographical Europe is liked more than the political one. The 3rd group of 21% shows a very strong global but also national orientation. The 4th group has

similar priorities but doesn't like Europe. The last group is very strongly attached to the local area and very weak to Europe and the world. 3-times the nation plays an important role and 3-times Europe is at last places.

10. N-Ireland

The 1st group shows a local and a regional identity well above the average and a national and European identity quite below the average. The 2nd group has a very strong global and a very weak local attachment. The 3rd cluster is characterized by a very strong national and a very weak international orientation. The 4th group combines a global-local identity on the positive side and shows a very weak European orientation on the negativ side. The last cluster is similar to the 3rd one and has a profile of a strong local-national and a very weak European attachment.

Summarizing it can be said: Four clusters have the European dimension below average. Two groups show a strong national attachment. The local orientation dominates before the global one.

11. Austria

The 1st cluster is characterized by a strong local and global reference and a very weak European identity. The 2nd group is nationally oriented but not Europeanly or globally. The 3rd cluster has a profile of a positive international but a negative local orientation. The 4th cluster shows a polarisation between global above and European below average. The last group has its maximal attachment in the local and its minimum one in the international dimension, but it makes a difference between a positive geographical European and a negative political European orientation. Four groups value Europe below average, two groups have it on 2nd place but the local and global attachment is the strongest one.

12. Poland

The 1st group shows a positive global-local orientation, but a negative European one. The 2nd group is predominantly attached to its nation but not to the local and global dimension. The 3rd group is regionally oriented but not nationally or Europeanly. It makes a difference between geographical Europe above and political Europe below its average valuation. The 4th cluster has a very strong local-national attachment, but a very weak global-European one. The last group is more internationally than regionally oriented. In most groups Europe has the weakest position and the regional dimension the strongest one. Two groups put the nation above average.

13. Romania

The first group shows a polarisation between the local and European dimension. The second group is quite similar to the first one and puts also Europe at the last place. The 3rd group is very small and therefore not so important. The 4th group takes Europe at first and the region at last place. The 5th group is nationally but not locally oriented. The overwhelming result is that 75% show a very strong local but a very weak European identity.

14. Switzerland

The first group shows a strong local and global attachment but not a national-European one. The 2nd group is characterized by a very strong global but a very weak regional orientation. The 3rd group takes geographical Europe at first but

political Europe at last place. That is a unique constellation. The 4th group has the regional identity above and humankind below average. The 5th cluster is locally but not globally oriented.

Four groups have political Europe on the weakest position but one group has geographical Europe at first place. The local identity is dominating.

15. Slovak Republic

The 1st group is at first globally and nationally oriented but at last locally. The 2nd group takes geographical Europe at first but political Europe at last place. The 3rd group combines a positive local and global attachment, but doesn't like Europe. The 4th very small group takes Europe on the first place of its priorities. The last group of 25% is predominantly locally and nationally oriented but not Europeanly. Europe doesn't possess any attraction for most groups in contrast to the local and global attachment.

16. Slovenia

The 1st group likes humankind but not Europe. The 2nd group is similar to the 1st one. The 3rd group shows a national attachment but not a global one. The 4th group is globally but not locally oriented. The 5th group takes the local and national reference at first and the global and European one at last places. Again Europe is the looser in the Slovenian priority list and humankind the winner.

17. Spain

The 1st group likes its region but not Europe. The 2nd group likes humankind but not Europe. The smaller 3rd group takes geographical Europe above and political Europe below its average valuation. The 4th group shows a local and national attachment but not the European and global one. The last group is nationally but not globally oriented. Four clusters are characterized by a negative European attachment. The local identity dominates.

18. Czech Republic

The 1st small group has a positive national and European orientation but a negativ local and regional one. The 2nd group likes humankind but not Europe. The 3rd group is nationally but not locally oriented. The 4th group shows a local and national attachment but not a European one. The last group takes the nation at first and humankind at last. 4-times the nation is on 1st positions of the priority list. The majority and the biggest groups aren't attached to Europe.

19. Hungary

The 1st group takes humankind and nation first and Europe last. The 2nd group has humankind on the positive and the local area on the negative side. The 3rd group is characterized by a strong national identity and a weak local identity. The 4th group has a strong local attachment but a weak global one. The last group prefers the nation and doesn't like Europe. Two groups have Europe below average. Three groups take the nation, two groups humankind and two the local area at first places.

20. Scotland

The 1st big group likes its region most but not Europe. The 2nd group likes humankind but not Europe. The 3rd group is similar to the 2nd one. The 4th group takes the nation and geographical Europe at first and the local area at last places. The

last group shows a polarisation between national dimension first and international priorities last. Summarizing it can be said: Europe has the weakest position within the identity profiles and the nation the strongest one.

21. Russia

The 1st group doesn't like the local area but humankind. But this group is very small. The 2nd group takes its nation at first place and the local area at last. Also this group embraces just 10%. The biggest group of 41% shows a very strong local identity and it doesn't like Europe whether geographical nor political Europe. The 2nd biggest group of 29% is similar to the 3rd one although it takes the global attachment together with the local identity on the highest places - but it doesn't like Europe. Just the last group of 17% shows a strong - but not very strong - reference to Europe and takes the global and national identity well below average. Summarizing it can be said: 70% have a very weak attachment to Europe. The local identity dominates also before the national one.

Summary

Figure 22 contains the summary of the different identity profiles, i.e. an generalisation of the individual outcomes to different classes or types of identities.

The 1st class of types has the global identity at first place but different identities at last places. It is obvious that the GlobEp-type is the most important one. A strong attachment to humankind is combined with a very weak European identity. The other two types of the Globclass i.e. GlobLoc and GlobNat with a local or national orientation below average are not so well represented.

The 2nd class of identity-types is characterized by a very strong local identity. Also here the LocEp-type dominates, that means this type doesn't like Europe. The LocGlob-type and the LocNat-type cannot be observed so often, but the first of both shouldn't be overlooked.

The 3rd class of identity types has its nation at first place of its priority scale. The 1st type shows a global reference on its negative side, the 2nd one the European identity and the 3rd one the local identity on its negativ side. This identity class is the 3rd strongest one.

The 4th class of identity types shows Europe at first place and the other identities at last places. This class is so small that one could believe it could be neglected but the EgEp-type is an interesting one, which could be observed not seldom between the maximal and minimal valuations of other types. This result shows that geographical Europe is liked more than political Europe. It is not easy to interpret that, but it is clear that the current political Europe isn't liked and that geographical Europe gets principally a hiher valuation. This phenomenon gives some hope for the European idea or Europe as a whole.

The research question about the European awareness can be answered now:
The Loc-class with 46% is the strongest class, and the LocEp-type with a very high local but a very low European identity is the most important type with 36%.

The Glob-class with 35% is nearly as important as the Loc-class. Here again the GlobEp-type with a weak appreciation of Europe dominates with 25%.

The Nat-class with 15% has the third place and the NatGlob-type with 9% is the biggest one.

fig. 22	Identity-Clusters of European Students												
	Glob Ep	Glob Loc	Glob Nat	Loc Ep	Loc Glob	Loc Nat	Nat Glob	Nat Ep	Nat Loc	Eg Loc	Eg Ep	Eg Glob	Eg Nat
B	20	18		24	16	21							
D/E	43		21	32			4,3						
D/W	44		11		11	19				14			
F	25	21		41	13								
GB	17			33	26			13		11			
Irl	33		9,1				53	14					
I	19			64			16						
L	19			68						11			.7,4
NL		30			23		26	21					
NIrl	16	8,8		51			19						
A	20	15		65									
PL	27	13		47			13						
Ro				75		3,8		10		11			
CH	15			41	25						18		
SR	36	17		25							15	6	
SLO	41	23		23			14						
E	22			44	16				8,4	9,3			
CZ	28			34			16		22				
H	25	12			23			19	21				
Scot	30			39			23		9,1				
RR	29	7		41		17			10				
%	25	8	2	36	7	3	9	3	3	2,5	1,4	0,2	0,3

(key: Glob = global, Loc = local/regional, Nat = national, E = European
(p = political, g = geographical))

The last Eg-class with 4%, which takes Europe first is the smallest one.

Summarizing it can be said:

There is no European enthusiasm and no broad solid psychological basis for building a new Europe. There is sometimes a strong national orientation, but nationalistic trends cannot be observed. The priority list is as follows: local, global, national, European.

May be that the following formulation of the leading philosophy on the territorial identity under the majority of European students describes the truth:

1. My home is my castle.
2. But also humanity belongs to my home.
3. My nation plays just an average role in my value scale.
4. Europe - as it is politically structured - doesn't attract me at all.

We will see, what the reasons for this result are, when we are going to interview coordinators and students in the different regions of Europe.

Territorial Order in Europe

Current concepts to overcome the psychological and political problems in Europe are selfdetermination of people and the change of borders. We are experiencing new borders in present times- mostly in the sense of seperatism. During the cold war the change of borders or the division of states would have meant hot war. That is the reason of the general doctrin of the untouchability of borders. But nowadays we can think about borders, states and new communities again and more freely. We should be able to change borders and to establish new states when people want it and not a dictator wants it. So the fate of states and borders should be in the democratic and peacefull hands of people. Of course, that is a big challenge and to handle not easily. What I am trying to explain is that borders in Europe have changed very often and we can surely expect new borders in the future. The question is what kind of borders do we want: borders of universal states, closed or open borders, less and less borders within larger communities or a new kind of borders for special and distinctive purposes. At least we should cooperate across the borders - not just in the western but also in the eastern part of Europe.

States and Communities in Europe have the task to direct the current trends and to manage the future. The question is whether the traditional universal state or the integration of smaller states to bigger communities in the sense of a universal supranational state is the right answer. The decision centres of big communities are so far away from many people and the decisions are so complex when the new supranational state wants to manage everything that they cannot be understood by many people and even the politicians who shall be expert for everything are helpless in many aspects.

In order to make our territorial order to a just order - accepted by the people in a democratic way, Burkhard Wehner recommends, to dissolve the traditional, universal state and to build new functional communities - as Scurity-, Currency-, Economy-, Culture-, Education-, Identification- and Solidarity Communities. Small states cannot guarantee their security. Therefore it is necessary to join a security community, small states are disadvantaged when they have a national currency. Therefore it is wise to join a Currency Community; but it is not necessary that every state in Europe is a member of this Currency Community. The same is true for an Economic Community. We cannot expect a homogenous Identity Community in whole Europe, so it is wise

to build smaller culturual and educational communities. Economy, Currency and Security Communities are bound on a territory but not culture and education. People - even dispersed people - can build a special Culture Community and all members pay taxes for their culture and education and the independent government of their culture community. All these functional communities are created by the people and have their own admnistration which is independent from the other communities. The tradtitional universal state is shrinked to the administration functions and the development of infrastructure. I find this new territorial and political order delivers more freedom for people particulary from different cultural background. In this way they are not dependent from the state or majority culture. On the other side the enlargment of other functional communities meets the supranational challenges of today and tomorrow.

This is not the model most experts are discussing in Europe. They are discussing about Europe of the regions, Europe of the nations and Europe as a Union - a combination of regional and national representation within a European Government - observing the subsidiarity principle, which means the lower level of administration should give its responsibility for a special function to a higher level of administration only when the higher level can fullfil it better.

I like this system of representation of regions and nations within a European government, it would be a step further, but it doesn't change the thinking in terms of nation states. I have the utopian hope that we can build different functional communities with a special independent government for every single community.

That is for example a chance to avoid a politisation of education and culture.

Conclusion

I know the above ideas look utopian, but I think we need such utopian inspirations and visions. Most of all, people have to understand and to accept the new models. The territorial identity plays an important role in the process of building a new just and peaceful European Order. To inform students about the structures, processes and problems and to offer them ideas to improve understanding and cooperation in Europe - is an important challenge for Geography Education.

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Appendix I

Nationality: _____   Sex: m ☐   f ☐   Age: _____ years
(passport)

Mother tongue: _____

People are attached to their nation, to Europa or a part of Europe, to their region or their place of residence.

Please indicate your personal position according to the following system of points:

0 : not
1 : a little
2 : more or less
3 : strong
4 : very strong

I feel attached to :

my nation	
Europe (political)	
Europe (geographical)	
my region	
my place of residence	
the humankind	

Please fill in (capital letters):

nation: _____

region: _____

name
of the place: _____

Time and again, one comes to hear which qualities are considered 'typical' of a country's people. On the following pages, we would like to collect some information on such opinions regarding various nationalities. Please give us your personal views by filling in this form - without giving your answers too much thought - and rate them according to the following points:

Appendix II: European Awareness
(Where questionnaires have been filled in)

Island : •

Türkei: •

Appendix III

European Awareness: Räume
(Erste erfasste Daten)

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Appendix IV

Invited national coordinators

Perikli Qiriazi	Tirana	**Albanien**
Dr. Ann Verhetsel	Antwerpen	**Belgien**
Xavier van de Poel	Brüssel	Belgien
Prof. H. van der Haegen	Leuven-Haverlee	Belgien
Merenne Schoumaker	Liège	Belgien
Dr. Marietta Casterlieva	Rousse	**Bulgarien**
Dr. Dimitar P. Kanchev	Sofia	Bulgarien
Prof. Ove Biilman	Kopenhagen	**Dänemark**
Tonny Hubbe	Kopenhagen	Dänemark
Prof. Dr. Eberhard Kroß	Bochum	**Deutschland**
Dr. Volker Albrecht	Frankfurt	Deutschland
Dr. R. Meincke	Greifswald	Deutschland
Heike Bütow	Greifswald	Deutschland
Prof. Dr. Siegfried Hermann	Halle	Deutschland
Prof. Dr. Karl-Heinz Kißner	Halle	Deutschland
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Prof. Dr. Frieder Dünkel	Greifswald	Deutschland
Prof. Dr. Walter Gropp	Frankfurt/Oder	Deutschland
Sepp Kalev	Estorio	**Estland**
Arvo Peltonen, Ph.D.	Helsinki	**Finnland**
Lea Houtsonen	Helsinki	Finnland
Hannele Rikkinen	Helsinki	Finnland
Dr. Katri Tiilikanian	Savonlinna	Finnland
Maryse Clary	Aix-en-Provence	**Frankreich**
M. Fontaine	Besançon	Frankreich
Nicole Nordon	Créteil	Frankreich
Jean David	Grenoble	Frankreich
Prof. Dr. Yvette Veyret	Paris	Frankreich
A. Audigier	Paris	Frankreich
A. Cauwet	Perpignan	Frankreich
Prof. Dr. W. Burzlaff	Perpignan	Frankreich
Prof. Gabriel Wackermann	Straßburg	Frankreich
Roger Dirrig	Straßburg	Frankreich
Dr. Apostolos Katsikis	Ioannina	**Griechenland**
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Douglas McMurtrie	Durham	Großbritannien
O.V. Dunlop	Glasgow	Großbritannien
Andrew Convey	Leeds	Großbritannien
Michael Naish, Senior Lecturer	London	Großbritannien
Alan Jenkins	Oxford	Großbritannien
Richard Daugherty, Senior Lecturer	Swansea	Großbritannien
Prof. Michael Williams	Swansea	Großbritannien
Prof. J. Heywood	Dublin	**Irland**
Dr. Desmond A. Gillmor	Dublin	Irland
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Adriana Galvani	Bologna	Italien
Prof. Maria Teresa Moscato	Catania	Italien
Prof. Adalberto Vallega	Genua	Italien
Prof. Guiseppe Zanniello	Palermo	Italien
Alberto Melleli	Perugia	Italien
Gino De Vecchis	Rom	Italien
Dr. M. R. Arnoldi-Cristofolini	Trient	Italien
Prof. Luigi Secco	Verona	Italien
Prof. Silvino Salgaro	Verona	Italien
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Anneliese Foss	Trondheim	Norwegen
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FINNISH SELF-IMAGE
AND
STEREOTYPES OF ITS NEIGHBOURS

Hannele Rikkinen

There was an interesting paper by Professor Hartwig Haubrich (1992) in the proceedings of IGU's Education Symposium. My article is based on that paper as well as on the questionnaire he later sent to the national co-ordinators, asking for co-operation in the European Awareness Project.

The Finnish inquiry

The project interested me very much and I translated the questionnaire into Finnish. I immediately handed it out to my students to be answered and also sent a copy to my colleague, Sirpa Anttila-Muilu, at Oulu University in northern Finland. Together we collected 124 completed questionnaires during the spring term of 1993. The respondents, 32 male and 92 female, were partly students from the universities of Helsinki and Oulu and partly older persons from the field of adult education. The age structure of the respondents was from 18 to 56 years, the mean being 29.1 years.

The Finnish Identity

The first part of the questionnaire concentrated on regional and national identity. The Finnish results are shown immediately after the questions. The questionnaire was:

People are attached to their nation, to Europe or a part of Europe, to their region or their place of residence. Please indicate your personal position according to the following system points: 0: not, 1: a little, 2: more or less, 3: strong, 4: very strong.

According to the results, Finns feel a very strong attachment to mankind and to their own nation. It is interesting to find out that Finns have a closer sense of belonging to the Nordic countries than to Europe as a whole. The regional identity is surprisingly low, which is partly due to the fact that the respondents were students, who do not presumably live in the communities they mentioned on the questionnaires.

The Finnish stereotypes

The second part of the questionnaire dealt with the self-images of the Finns and their images of the three neighbouring nations. In my article I wanted to find out the images the Finns have about the Swedish, Russians and Estonians, the closest neighbours of Finland.

Finns have a lot of historical and cultural connections with all of those nations but feelings may vary very much about each of them. There is a slogan in Finland

I feel attached to:	Mean	SD
my nation: Finland (100%)	3.18	.83
Europe	2.20	.89
a part of Europe: the Nordic countries (35), Northern Europe (30), Scandinavia (25), Western Europe (6), Nordic (4) and some scattered expressions (7)	2.41	.78
my region: names of different regions, such as Southern or Northern Finland, the Nordic countries, the area of the capital city, etc.	2.41	1.02
the community in which I live: several Finnish communities	2.64	1.05
mankind	3.27	.93

"Swedes are our dearest enemies!" The time when the questionnaires were handed out was extraordinary. Estonia was just re-born as an independent state, and Finland_s great but not so loved neighbour, the Soviet Union, was breaking down. I was anxious to find out, whether Finns hold different stereotypes of Russians and Estonians.

The respondents had to fill in four similar lists of attributes, one for every named nationality. The instruction shows all the given attributes in English.

The instruction was:
Time and again, one comes to hear which qualities are considered "typical" of a country's people. On the following pages we would like to collect some information on such opinions regarding various nationalities. Please give us your personal views by filling in this form (50 attributes) - without giving your answers too much thought - and rate them according to the following points: 0: not, 1: a little, 2: more or less, 3: strong, 4: very strong
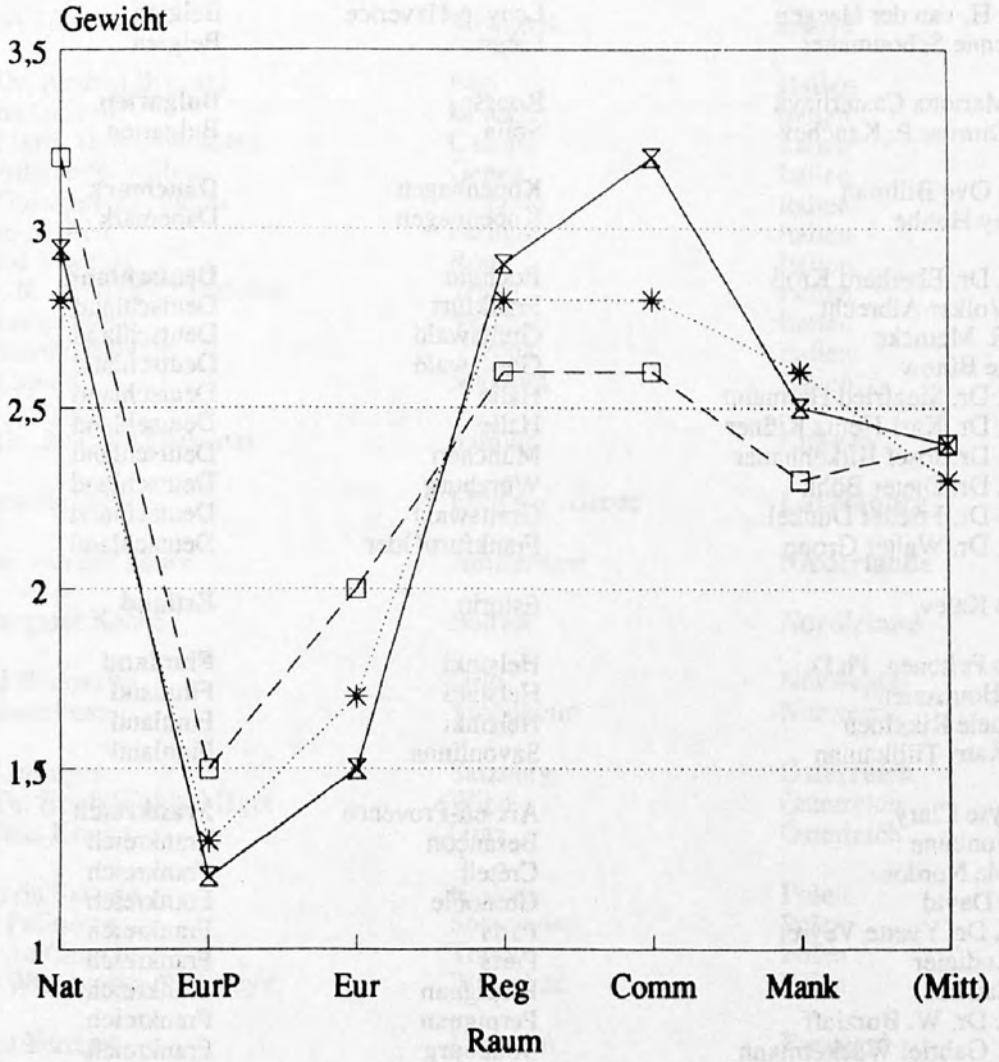
1. poor
2. old-fashioned
3. considerate
4. hard-working
5. peaceful
6. economical

26. patient
27. interest in things
28. fun-loving
29. politic.-minded
30. charming
31. serious

7. loud	32. amiable
8. sincere	33. rich
9. clean	34. progressive
10. talkative	35. sensitive
11. carefree	36. religious
12. generous	37. fond of children
13. sociable	38. quarrelsome
14. intelligent	39. reserved
15. ambitious	40. slow
16. friendly to.foreig	41. indifferent
17. light-hearted	42. conscientious
18. self-confident	43. friendly
19. sportive	44. aware of environm.
20. tradition.-minded	45. hospitable
21. energetic	46. musical
22. patriotic	47. modest
23. inquisitive	48. skillful
24. tolerant	49. self-critical
25. companionable	50. fashion-conscious

It should be mentioned that the translation of the attributes used may lead to different connotations of the words. But, anyway, the Finnish respondents gave their personal views and table 1 shows a part of the Finnish results.

Examination of the results

When I handed out the questionnaire to my students for answering, they complained that it was difficult, boring and confusing to fill it in four times. It was also difficult to keep in mind the rating system from 0 to 4. So, there may be many mistakes of this kind in the answers.

The given attributes differ greatly from each other. Some of the attributes have a limited sense; some are words of wide interpretastion; some are familiar and some used very rarely. There are some attributes the meanings of which are almost identical and some that have completely opposite meanings. However, even some synonyms can have different shades of meaning depending on the context in which they are used. Besides, it is difficult to say whether a certain attribute carries a negative or a positive connotation.

In any case, the Finnish respondents made their subjective value judgements on each nationality, and the summary of some results is shown in Table 1. The differences in the auto- and heterostereotypes have been compared in Fig. 2.

The easiest thing was to rate one's own nation. The percentage of the respondents leaving blanks when making judgements on their own nation, was lowest, only 1.9% (117 blanks altogether). The most difficult task was to rate Russians, 4 % (246 blanks), then Estonians, 3.4% (208 blanks) and Swedes 2.7% (165 blanks).

After all, the results (Table 1) and the diagrams (Fig. 1) show that there are differences in the respondents' auto- and heterosterotypes. Finns see themselves as very clean, peaceful and patriotic, not as rich but not as poor, either. Finns identify themselves as neither progressive nor old-fashioned but to some extent a little bit traditionally-minded. Finns are characterized as reserved, self-critical and serious

Table 1. The 12 highest-valued and 10 lowest-valued attributes of the Finnish respondents (N = 124) about themselves and the three closest neighbour; A. Swedes, B. Estonians, C. Russians and D. Finns. (M = mean of the points and SD = Standard deviation).

A	M	SD	B	M	SD	C	M	SD	D	M	SD
5	3.15	.71	22	3.43	.76	1	3.20	.19	9	3.27	.69
9	3.27	.71	1	3.20	.81	2	3.14	.87	5	3.27	.71
10	3.01	.81	20	2.93	.89	20	2.97	.88	22	3.21	.72
7	2.93	.96	2	2.77	.84	22	2.76	.89	42	2.85	.70
22	2.91	.84	45	2.76	.92	29	2.76	.93	8	2.85	.74
50	2.83	.84	23	2.72	.82	46	2.68	.88	4	2.76	.65
19	2.80	.68	16	2.69	.91	37	2.50	.91	23	2.75	.76
15	2.80	.80	37	2.67	.75	25	2.47	.78	49	2.75	.87
34	2.79	.70	5	2.67	.89	36	2.43	1.1	39	2.75	.78
25	2.75	.77	26	2.64	.83	7	2.41	.95	19	2.70	.75
28	2.73	.88	17	2.62	.88	10	2.40	.92	31	2.70	.85
33	2.72	.68	43	2.58	.79	13	2.40	.92	20	2.65	.74
*											
32	1.72	.81	19	1.70	.85	32	1.67	.86	25	1.94	.67
30	1.64	.84	41	1.66	.85	42	1.62	.81	16	1.92	.87
41	1.63	.85	30	1.66	.77	30	1.43	.83	30	1.91	.72
31	1.53	.80	11	1.60	.89	8	1.40	.79	28	1.86	.82
36	1.48	.84	38	1.60	.88	9	1.35	.73	24	1.83	.76
39	1.47	.76	7	1.60	.85	4	1.32	.96	7	1.75	.95
40	1.23	.70	34	1.47	.82	34	1.18	.83	11	1.64	.74
47	1.18	.85	44	1.40	.93	50	.86	.83	10	1.63	.71
2	.95	.93	50	1.05	.92	44	.84	.79	2	1.60	.79
1	.55	.71	33	.74	.64	30	.81	.68	1	1.24	.85

rather than talkative or loud; conscientious, sincere and hard-working rather than carefree. It seems that the respondents have a quite nice picture of themselves or of the Finnish people in general. However, also the lowest-valued attributes on the list got relatively high points.

It is interesting that the respondents see themselves in some way similar to Swedes, not to Estonians or Russians. However, there are certain differences in the characterization. Swedes are seen as peaceful and clean and nearly as patriotic as Finns and even less poor and old-fashioned. Finns also have the image that Swedes are very talkative and loud, quite fun-loving, companionable and much less reserved and modest than Finns. Swedes are not slow, in fact, they are more sportive than Finns themselves. Swedes are also considered to be fashion-conscious, ambitious and progressive.
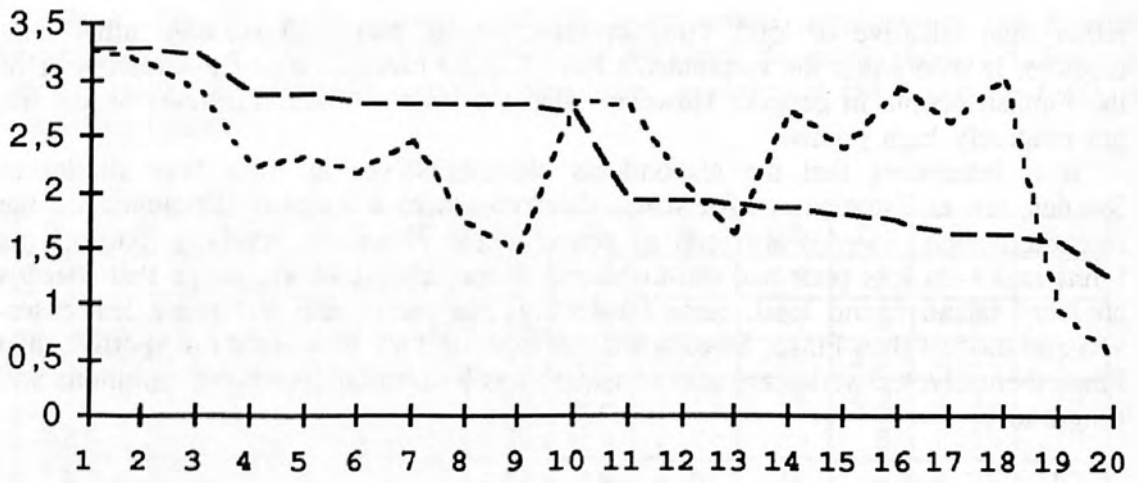
A. Finns as compared with Swedes

B. Finns as compared with Estonians
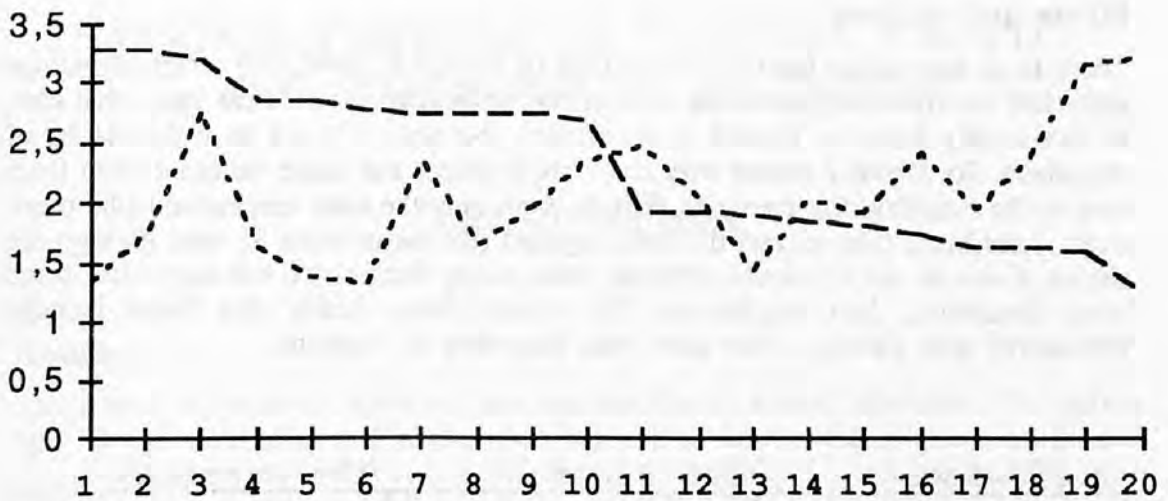
C. *Finns as compared with Russians*

1. clean	11. companionable
2. peaceful	12. friend.tow.foreig.
3. patriotic	13. charming
4. conscientious	14. fun-loving
5. sincere	15. tolerant
6. hard-working	16. loud
7. inquisitive	17. carefree
8. self-critical	18. talkative
9. reserved	19. old-fasioned
10. sportive	20. poor

Fig. 1. The Finnish self-image. (the 10 highest-valued and 10 lowest-valued attributes) as compared with the value judgements of the same attributes about the neighbouring nationalities.

The images about Estonians and Russians are similar in some degree. They are both seen as poor, not rich, fashion-conscious and traditionally-minded,and Russians as even more old-fashioned than Estonians. Russians do not take care of the environment at all, even less than Estonians. Estonians, on the other hand, are the most patriotic of all these four nationalities, even more than the Finns themselves. That is easy to understand in the light of the recent events taking place in the Baltic countries. It is exciting that Finns see Russians as politically-minded and musical, fond of children and companionable, loud and talkative, even though the judgement points are not very high. However, there are distinct differences between the Finnish images about Estonians and Russians. Estonians are seen as much more hospitable, inquisitive, friendly (also towards foreigners), peaceful, patient and light-hearted than their former masters. These positive attributes cannot be found at the top of the ranking list for Russians, but these do not exist on the other lists, either. According to the results, the Finnish image about Estonians was at that time at its most positive. Perhaps, if the study were made today, the image might be less positive. The circumstances are now different and the image on "the news" on TV and in newspapers is now less positive.

Mirror and windows

There is an interesting figure in the article of Haubrich (1992, 33) which illustrates auto- and heterostereotypes in the form of mirrors and windows. I can make that kind of model only from the Finnish point of view, because I do not have the results of the others. So, figure 2 shows only the Finnish mirror and three windows open from here to the neighbouring countries. Within them only the most emphasized (the mean over 3) attributes (above) and the most rejected (the mean under 1) ones (below) are shown. Finns do not reject any attribute when rating themselves, but they reject some when describing their neighbours. The results show clearly that Finns identify themselves with Swedes rather than with Estonians or Russians.

The Swedes	The Finns	The Russians
Peaceful	Clean	Poor
Clean	Peaceful	Old-fashioned
	Patriotic	Talkative
Old-fashioned		Fashion-consci.
Poor		Aware of env.is.
		Rich

The Estonians
Patriotic
Poor
Rich

Figure 2. The most emphasized and rejected attributes that the Finnish respondents used in describing themselves and their neighbours.

References:

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NATIONAL CURRICULUM, NATIONAL IDENTITY AND GEOGRAPHICAL EDUCATION

Michael Williams

Abstract

The concett of place is central to an understanding of school geography. The nation state is one such place and it is argued that this is both a spatial phenomenon and a cultural phenomenon with strong affective characteristics. Legislation for a National Curriculum in England and Wales has permitted differences between England and Wales. Significant differences are found in the geography curriculum in Wales and these are highlighted in the curriculum Cymreig which has been promoted by the Curriculum Council for Wales. Proposed changes in the geography curriculum are considered in the light of contemporary debate about cultural restoration and nation building.

Introduction

There is likely to be universal agreement among geographical educators that one of the key functions of school geography is to enable young people to:
'demonstrate their increasing knowledge and understanding of places in local, regional, international and global contexts, particularly:
i) a knowledge of places;
ii) an understanding of the distinctive features that give a place its identity;
iii) an understanding of the similarities and differences between places; and
iv) an understanding of the relationships between themes and issues in particular locations'.

This quotation is taken from the statutory Orders laid before Parliament in London in 1991. These Orders prescribe the attainment targets and programmes of study in geography for pupils in the age range 5-16 years. The second attainment target is titled Knowledge and Understanding of Places and in the published Orders (Welsh Office, 1991, 7-11) statements of attainment are listed to illustrate how this attainment target can be broken down into ten levels of achievement. In this paper an attempt is made to explore the concept of place, which must be known and understood, in the context of the cultural divide between England and Wales. In particular, the importance of place in school geography will be examined in the contexts of national identity and citizenship within England and Wales. Two analytical approaches will be used. The first is technical in character and focuses on aspects of curriculum design. The second is more theoretical and draws on the work of radical theorists in the contexts of cultural restoration and nation-building.

The British Context

It is important at the outset to acknowledge that much British writing about the school curriculum, in general, and the geography curriculum, in particular, is specific to the educational system of England. This assertion alerts one to the different curriculum arrangements in Northern Ireland, Scotland and Wales. Thus the statutory Orders referred to in the opening paragraph have legal authority in Wales where there are curriculum modifications intended to recognise particular Welsh circumstances.

Discussion in this paper focuses sharply on curriculum reforms in Wales which have followed the passing of the Education Reform Act of 1988. This Act replaced in England and Wales a decentralised, largely school determined curriculum in state primary and secondary schools with a tightly regulated, centrally determined curriculum. The Act specified the subjects which were to be taught as part of a National Curriculum and established three agencies for implementing the changes. In England these agencies were the National Curriculum Council and the School Examinations and Assessment Council. In Wales there was the Curriculum Council for Wales. In recent months these agencies have been replaced by the School Curriculum and Assessment Authority in England and the Assessment and Curriculum Authority for Wales. The Secretary of State for Education (i.e. the Minister of Education) and the Secretary of State for Wales established school subject-specific working parties to define attainment targets, programmes of study and assessment arrangements for each of the subjects in the National Curriculum. The products of their work were the statutory Orders for each subject. The Orders for geography were published by the government in 1991 and there were separate Orders for England and for Wales. Shortly after, the curriculum councils published non-statutory guidance for geography teachers 'designed to help busy teachers get to grips with the main features of the geography Order' (National Curriculum Council, 1991). For England, the National Curriculum Council defined geography as, 'National Curriculum geography is concerned with the study of places, the human and physical processes that shape them and the people who live in them'. For Wales, the Curriculum Council for Wales (1991b) answers the question 'What is Geography?" as follows:

> 'Geography explores the relationship between the earth and its peoples. It studies the location of the physical and human features of the earth and the processes, systems and interrelationships that create and influence them. The character of places, the subject's central focus, derives from the interaction of people and environments' (p.4).

We would emphasise the strength of the phrase 'character of places' in an official document, and especially a document designed for a non-English readership. It is clarified later in the same publication (p.8) where one reads:

> 'The Welshness of the geography curriculum will manifest itself differently in each school. Accordingly geography should be taught in such a way that the content is relevant to each pupil's own experience within his/her community in Wales ...

National Curriculum Geography in Wales should:
- involve pupils in a deeper understanding of themselves in relation to their local area, Wales and the wider world;
- enable pupils in Wales to be made aware of the diversity of environmental and economic conditions within Wales and of the factors which contribute to them;

- develop an understanding of Wales as a geopolitical entity and of the variety of perspectives of its inhabitants;
- undertake studies of the geography of Wales on a variety of scales in order to help pupils to understand how physical and human processes interact and bear on the character of a part of, or the whole of Wales;
- reinforce understanding of geographical themes through the inclusion of Welsh examples alongside others to enhance learning;
- develop an understanding of the relationship between processes which have shaped the geography of Wales and other parts of Britain;
- relate the geography of Wales to the geography of the wider world through the selection of those areas of study which are relevant to the Welsh experience'.

A careful reading of this brief list of statements brings out some interesting issues, including :

a) the assumption that, even in a tightly prescribed National Curriculum framework individual schools will have different manifestations of the Welshness of the geography curriculum;

b) the content of geography should be taught in such a way that it is relevant to each pupil's own experience and this is reinforced by the assertion that pupils will gain a deeper understanding of themselves in relation to their local area;

c) the definition of Wales as a geopolitical entity, thereby introducing a transparent political aspect to the discussion;

d) the location of studies of Wales in a broader British and whole world framework in which the selection of areas for study will be determined by their relevance to the Welsh experience.

Here we have a tempering of the argument that the National Curriculum is a straitjacket which restricts the curriculum autonomy of individual schools. For geography specialists, not only are they encouraged to define their own curricula, they are also encouraged to promote a constructivist view of the subject, one in which each individual pupil will acquire and develop his/her own private geography. Further, a blatant Welsh-centric view is promulgated so that geographical studies at whatever spatial scale are worthy of attention because of their relevance to 'the Welsh experience'.

Following these introductory considerations, which have drawn directly from the statutory Orders and non-statutory guidance for geography, we can turn to a number of other publications of the Curriculum Council for Wales which offer advice to geography specialists which is of particular importance in exploring the Welsh dimension of the geography curriculum. Initially, our concern will be with the technical, curriculum design advice offered to geography teachers.

Technical, Curriculum Design Aspects of the Welsh Dimension

The Curriculum Council for Wales is to be commended for seeking to establish a coherent framework for the curriculum which was rational and intellectually defensible. It drew for its inspiration on the publicity given by HMI (Department of Education and Science, 1977) to a list of areas of experience which had been derived from the work of American and British philosophers of education. The Curriculum Council for Wales chose the term 'aspect of learning' rather than area of experience and they argued (1991c, 7) for a broad and balanced curriculum which should take

into account 'eight aspects of learning which together describe the full range of experiences to which pupils are entitled'. The eight aspects of learning were listed as: expressive and aesthetic; linguistic and literary; mathematical; physical and recreational; scientific; social and environmental; spiritual and moral; and technological.

These aspects of learning were the foundations on which was built a framework for a whole curriculum which was perceived as being coherent for pupils aged 5-16 years. The framework indicated the relationships between subjects, cross-curricular themes, cross-curricular competences and cross-curricular dimensions. For the purposes of this paper it is the importance given to 'Welshness' by the Curriculum Council for Wales in its publication on the whole curriculum and we can trace this component through other non-statutory publications issued by this agency.

The overall tone was set by the contents of this paragraph from the whole curriculum publication (Curriculum Council for Wales, 1991c):

'The whole curriculum in Wales encompasses and reflects in its content or exemplification both the English and Welsh language cultures in the country and the whole range of historical, social and environmental influences that have shaped contemporary Wales. The Welsh language adjective "Cymreig", which is defined as concerned with Wales", best conveys this meaning and such a curriculum might, therefore usefully be referred to as a curriculum Cymreig" (p.4).

In addition to the provision for the inclusion of the Welsh language in the curriculum, the Curriculum Cymreig was defined as having a content distinctive to schools in Wales:

'Although most parts of the National Curriculum are common to England and Wales, the statutory requirements for some subjects will differ, at least in part, between the two countries e.g. in history and geography' (p.4).

'...the "Welshness" of the curriculum is seen in the ways in which content, whether common to Wales and England or distinctive to Wales, is exemplified in pupils' learning experiences. Thus the social, cultural, economic and environmental contexts to which knowledge, skills and concepts are related in teaching and learning programmes can, and should, be concerned with Wales as well as with the wider world. In many ways this is the heart of the matter. The Welshness of the curriculum will manifest itself differently in each school. However, all subjects should be taught in such a way that the content is meaningful and relevant to the pupil's own experience within his/her community' (p.5).

Not surprisingly, the Welshness of the communities in which pupils lived was a prominent focus of the publication (Curriculum Council for Wales, 1991a) produced to define the cross-curricular theme Community Understanding. It needs to be emphasised that this theme was titled Citizenship Education in England. In the Welsh publication there was a strong emphasis on cultural heritage, on the one hand, and social reconstruction, on the other. We would also draw attention to the active, participatory roles which pupils were perceived as acquiring through this cross-curricular theme:

'The development of Community Understanding within the whole curriculum will help pupils to identify and appreciate the common experience of their

cultural heritage as well as understand its diverse and distinctive aspects. It will assist them in taking responsibility for, and control of, their own lives. At the same time they will be encouraged to contribute, as active, participating, critically reflective members of their communities in Wales, or wherever they may subsequently live' (p.2).

The statement of aims for community understanding make the intentions in this paragraph more explicit:
'Community understanding aims to help pupils to:
- appreciate the common experience of their cultural heritage;
- know what is distinctive about their own communities;
- understand how heritage is mediated and modified by time and place;
- reflect critically on their own experiences and make informed judgements;
- develop positive attitudes and personal values;
- take an active and meaningful part in the life of their communities' (p.3).

Teachers were encouraged to provide pupils with opportunities to explore their communities in a variety of ways from a range of perspectives including: geographical, historical. social, economic, political, cultural and scientific so as to strengthen their sense of belonging. In becoming aware of their communities it was hoped that pupils would understand and appreciate the distinctive features of community life in Wales.

The authors of Community Understanding identified eight components as a framework for teaching about the community: becoming a member of a community; patterns of social life; active citizenship; human rights; participation in decision-making; order, conflict and change; people, work and the distribution of resources; and values and beliefs. It is not difficult to select from the descriptors for each of these eight components concepts and ideas with a specific geographical relevance. They serve to highlight the citizenship component of school geography. We would expect the same emphasis to emerge in the non-statutory guidance for teachers offered by the Curriculum Council for Wales for the cross-curricular theme environmental education.

Advisory Paper 17 (Curriculum Council for Wales, 1992) has three parts: perspectives on environmental education; a framework for environmental education; and the creation of conditions and opportunities for effective environmental education. Three goals for environmental education were advocated and these were distinguished by the lack of any attempt to give them a particular Welsh character. They read (p.8):
'a) to foster clear awareness of, and concern about, economic, social, political and ecological interdependence;
b) to provide every young person with opportunities to develop knowledge, values, attitudes, commitment and skills needed to protect and improve the environment and achieve more sustainable forms of human development;
c) to encourage the emergence of responsible patterns of behaviour towards the environment by individuals and communities'.

One of the strongest assertions in the document is that, 'All the statutory subjects can contribute to environmental education if the approach to teaching and learning is explicitly designed to develop environmental awareness, concern and capability' (p.8) and geography is cited as one of the subjects in which opportunities for providing

environmental education is most evident. The authors proposed three key ideas central to environmental learning: systems and interdependencies; change and development; and sustainability and stewardship, and there are three fundamental groups of processes which can facilitate this learning: enquiry and critical reflection; communication; and participation and action.

What emerges from these publications is an emphasis on a holistic view of the curriculum and one which ties together statutory subjects, including geography, and non-statutory cross-curricular themes which have a direct relevance to geography teachers. The task for the geography teacher is to meet the statutory curriculum requirements specified in the governmental Orders while accommodating aspects of the cross-curricular themes. There is an assumption that the inclusion of these aspects will not impair geographical learning but rather will enhance it.

For geography, there was a recognition by central government that the subject had a specifically Welsh dimension and that the government prescribed programme of study should reflect this. The authors of the Curriculum Council for Wales (1993) publication concerned with promoting the curriculum Cymreig argued that, 'There is a difference of perspective as well as a difference of content. Every pupil attending schools in Wales should be aware of a distinctive Welsh perspective when looking at a wider world' (p.9). They identified five 'specific elements which, taken together, constitute a curriculum Cymreig': a sense of place and heritage; a sense of belonging; an awareness of the importance of language and literature; an understanding of the creative and expressive arts; and an awareness of religious beliefs and practices.

The Curriculum Council for Wales (1991c) offered a simple model as a basis for curriculum planning and this was to be referred to in all subsequent curriculum publications of the Council. In essence, at the centre of the model was the vision and ethos of the individual school which was to accommodate and assimilate statutory prescriptions and non-statutory advice and guidance. The whole curriculum and the individual subjects, cross-curricular themes, dimensions and competences would be subjected to careful auditing before curriculum plans were designed and implemented. The implementation would be reviewed and evaluated before the whole cycle of planning commenced again.

Theoretical Aspects of the Welsh Dimension of School Geography

This section draws on the ideological discussion which has accompanied the introduction of the National Curriculum. In particular we base our analysis upon two concepts which are particularly useful: social restoration and curriculum nationalisation.

We encounter the term social restoration in the writings of academics - policy analysts and educational sociologists - in countries as diverse as England (e.g. Ball, 1990a and 1993), the United States (e.g. Giroux, 1989) and Australia (Kenway, 1990). The contexts in which the term is used are similar in that the focus is on the impact of the New Right on educational policy making in recent decades. Ball (1990a, 6) refers to the cultural restorationists as the 'hard-line, old humanists of the New Right' whose 'main policy preoccupation is with the re-valorisation of traditional forms of education' (Ball, 1993). Giroux (1989, 129) criticises what he calls the 'traditional world view' of so-called educational traditionalists for whom 'schools were seen almost exclusively as instructional sites. That schools were equally influential as cultural and political sites was largely ignored (until the late 1980s), as was the

notion that they represented areas of contestation among differentially empowered cultural and economic groups'. It was the New Right which personified these traditionalists but we need to be aware that the New Right is not a monolithic concept. As Kenway writes (1990, 168-169), 'Although modes of analysis and theoretical frameworks and interpretations vary, there is nonetheless some agreement that the New Right consists of a loose amalgam of different sets of interests, that its organizing theoretical ideology includes an uneasy blend of many, sometimes contradictory, strands of political thought, and that it demonstrates a ready capacity for developing political rhetoric which both produces and taps contemporary popular concerns and discontents (Cohen et al, 1986; Levitas, 1986; Elliott and McCrone, 1987; Hoover, 1987; Milliband et al, 1987)'.

Of particular interest to this paper is the assertion of the critical theorists that school culture, including the curriculum, 'functioned not only to confirm and privilege students from the dominant classes; it also functioned through exclusion and insult to disconfirm the histories, experiences and dreams of subordinate groups' (Giroux, 1989, 129). In a British context, it is important to view the centralising tendencies of the Department for Education in England from the Welsh perspective. To what extent is the education system in Wales, which is the responsibility of the Welsh Office, subordinate to England? To what extent is the acknowledgement that Wales required different statutory Orders for some school subjects, including, as we have seen, geography, a recognition that the Welsh have different histories, experiences and dreams'?

It is this emphasis on difference which Jones, writing as a Welsh educational historian, (1990, 163) has highlighted:

'What, then, is distinctive about the Welsh experience? First, there is a sense of place. Since the dark ages the story of the Welsh has unfolded west of Offa's Dyke. The topography of the country has always influenced, and still influences, the pattern of settlement, the way in which the Welsh people make their living, whether through agriculture or industry, in the hill country or in the valleys. The pattern of communications or lack of them, conditions links (or lack of them) between north and south Wales, the relationship between these areas and the English hinterland, for example with Bristol or Liverpool. Topography helps determine economic and occupational relationships within Wales and outside, as it has done through the centuries. Much of this dimension of the Welsh experience goes, I believe, under the name of Geography and so should form part of the staple diet of pupils in Wales as part of that subject within the National Curriculum'.

This is a simplistic view of place in that it acknowledges only a deterministic perspective: topography determines patterns of settlement, communications and industrial location. This is the perspective of the cultural restorationist who sees the value of geography in schools predominantly in terms of telling pupils where selected places are. It is a perspective which Ball (1993) claims stands out in the report of the Geography Working Group set up by the Department of Education and Science (as it was titled then, and has since been renamed the Department for Education) and he is strong in his criticism of it,

'The report appears to aim at a repositioning of the UK in some mythical golden age of empire. Geography is tied into an unstated politics of space ... The emphasis is upon the subordination of the learner to place and space

rather than on analytical control. Distance is a fact here rather than a stance. The learner is lost in untheorised space and is left only with a list of memorised capitals ... With its undertones of assimilation, nationalism and consensus around the regressive re-establishment of fictional past glories restorationist National Curriculum geography isolates students in time and space, cutting them off from the realities of a single European market, global economic dependencies and inequalities, and ecological crisis (pp.202-203).

In a patriotic and nationalistic context place takes on mythical and emotional significance. Frontiers, capital cities, heroic sites and selected topographical phenomena become part of the individual's sense of identity. As Altman and Low (1992, 10) write,

'Place attachment serves a number of functions, providing a sense of daily and ongoing security and stimulation ... and the chance to control aspects of one's life; place attachment may link people with friends and kin in overt and visible fashion. It may bond people to others symbolically, providing reminders of childhood or earlier life ... and link people to religion, nation, or culture by means of abstract symbols associated with places, values and beliefs'.

For members of minority nations 'territory itself ... is the very foundation of principality and sovereignty' (Foucault, 1991, p.93). It is this territorial imperative which renders the application of the concept of cultural restoration to the curriculum of Welsh schools different to its application to the curriculum of English schools. While cultural restoration in England can be attacked as a process of celebrating nostalgia and seeking to re-establish an educational Victorianism centred on discipline, authority and learning (Ball, 1993, 209), in Wales it can be welcomed as a process of raising national consciousness and encouraging voluntary separatism. Through the publication of statutory Orders for geography by the Welsh Office and and through the publication of non-statutory guidance for geography and the cognate aspects of the cross-curricular themes Wales has been given the opportunity to define its own distinctive approaches to the content and pedagogy of school geography. Wales has been empowered to define its own national space and to identify the relationships of that space to England, Europe and a wider world.

This recognition that the opportunity exists to grasp the national nettle and implement a curriculum Cymreig is of considerable importance for the future of the geography curriculum in Wales. Geography teachers need, however, to acknowledge that the nation can be perceived as 'a construct of the modern imagination and an historical invention on the part of particular categories or classes of modern societies' (Smith, 1993, 10). In contemplating the potential of school geography for contributing to the process of nation-building, Welsh geography teachers should take heed of the historical analysis of the invention of nations in the British context offered in a collection of essays edited by Hobsbawm and Ranger (1983). What are considered as essential characteristics of national identity, including national flag, national anthem, national rituals such as festivals, and national costumes, are found to be of recent origin and are not elements of any long-established cultural heritage. Smith (1993, 11), drawing on the work of Hobsbawm and Ranger, refers to the invented traditions of nationalism which 'are of a ritual or symbolic nature and seek to inculcate certain values and norms of behaviour by repetition, automatically implying continuity with the past'. In Europe, the period 1870-1914 has been identified as the

heyday of invented traditions and the creation of nations (Hobsbawm, 1990). In central and eastern Europe. It could be argued that we are witnessing a new round of nation-building with interest groups of various kinds seeking to establish or re-establish nationalistic characteristics of new nation states. Geography teachers are faced with the challenge of redefining geography curricula and high in their list of priorities will be determining the emphasis which should be given to the nation state as not only a spatial phenomenon but also a cultural phenomenon.

Conclusion

In nationalising the school curriculum, the government of England and Wales has given geography teachers in Wales the opportunity to think afresh the nature of their subject in Welsh schools. There is no evidence from any empirical studies to demonstrate the extent to which geography teachers have sought to exploit the new opportunity. Through emphasising the concept of curriculum Cymreig the Curriculum Council of Wales has encouraged geography teachers to think carefully about the Welshness of school geography. This should alert teachers to the importance of mythical and affective space in a national context. Critical theorists have pointed to the negative aspects of a nostalgic and jingoistic conception of nationhood but we would also emphasise the importance of a constructive conception of nation building which empowers teachers as curriculum designers and gives students an enhanced sense of spatial identity. The dangers of a racist neo-nationalism are evident in many countries today. Achieving an appropriate balance between the negative and positive characteristics of nationalism is a continuing challenge for geography teachers as they seek to contribute to citizenship education.

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DEVELOPING TEACHING MATERIALS
A BERLIN CASE STUDY

Michael Naish

Abstract

For its 1992-1994 Project, the British Sub-Committee of the IGU Commission for Geography Education decided to work on a model for the production of teaching materials and then to exemplify this with a set of materials on Berlin.

Members of the Sub-Committee met on three or four occasions in each of the two years to plan the Project, attempt to raise funds, discuss progress, review draft materials and deal with presentation and publication matters.

A number of members were able to visit Berlin where they met colleagues interested in the work and willing to support its development. Further links were developed with colleagues in Britain.

It is anticipated that the production of materials will be advanced by the time of the Berlin Meeting of the Commission, but not yet at publication stage. Constructive feedback from the Berlin Meeting is anticipated, which should enable the Sub-Committee to take the work through to publication.

Introduction

The British Sub-Committee of the International Geographical Union Commission on Geography Education is an informal group British geography teachers and lecturers, whose aim is to link closely with the Commission, to produce work for each Meeting and Symposium of the Commission and to publicise its work in the United Kingdom.

In recent years, the Sub-Committee has undertaken research and published the results for wider dissemination. In the period 1990-1992, the Sub-Committee researched the impact of centralised education systems upon the geography curricula of those systems (Naish 1990). During the 1992-1994 period, the Sub-Committee focused on the situation in primary schools in England in order to illuminate the issues, problems and advantages which were anticipated as schools faced up to the implementation of the new Geography element of the National Curriculum (Naish 1992). It was the strong view of the Sub-Committee that such a study would be of considerable interest for a wide international audience, since the introduction of a national curriculum in the British education system was a radical and unprecedented event. It was anticipated that there would be important messages for all systems where geography is part of a centralised curriculum.

For the period 1992 to 1994, the Sub-Committee decided to break this developing tradition of investigative research and concentrate rather on work that might be even more directly applicable to the classroom - the development of a set of teaching materials. It was agreed at early meetings, that these materials should be based on a model, constructed by the Sub-Committee, to aid the production of teaching

materials. The Sub-Committee would then exemplify the use of such a model through the production of a set of materials on Berlin.

The production of a model for materials production

It was felt, by members of the Sub-Committee, that considerable experience and expertise already existed with respect to the conceptual notions involved in a model of teaching materials production. Several of the Sub-Committee members had been or still were connected with curriculum projects which had supported the idea of clear and explicit thinking about the task of producing teaching materials.

In particular, there had been much involvement with the Schools Council Projects of the nineteen seventies and 'eighties, which had been so influential on the development of the geography curriculum in the British Isles and, indeed, for a wider international involvement. In particular, the work of the Geography for the Young School Leaver Project, the Geography 14-18 project and the Geography 16-19 Project can be traced in the development of courses for 14 to 16 year old students working towards the General Certificate of Secondary Education. There was much national debate and concentrated planning for this examination during the mid-nineteen eighties, through the development of national general and subject specific criteria and it is in this work that the influence of the projects can be seen.

In addition to this experience, certain members are also currently involved in curriculum projects. A notable example of this is Professor Bill Marsden's Associate Directorship of the Geography Inset Primary Project (GIPP) at the University of Liverpool.

Working on the basis of this experience and also building in the fresh views of members who had not as yet gained experience through formal involvement in curriculum development projects, the Sub-Committee prepared the model shown in Figure 1. The left hand side of the model is concerned with clarifying objectives and the right hand side with a planning sequence. The model should be 'read' from the top left, where it is suggested that preliminary thinking should be concerned with the nature of the learners, their age, previous learning, their progression through previous learning to the topic in question and their match to the demands which it will predictably make upon them. The question of timing should, it is suggested in this model, be considered at an early stage, taking into account when the unit is to be taught and the amount of time available.

The general aims of the unit should be considered in the light of the above considerations and these then broken down into more specific objectives concerning knowledge, skills and values. While the Sub-Committee believes in the importance of clarifying objectives, it does not consider that these should be set out in exhaustive detail in the form of behavioural objectives. Rather these statements of objectives are thought of as broad guidelines. The **process** of learning, the development of skills and the consideration of values and attitudes on the part of the learners are considered to be as important, if not more important than a detailed list of content objectives. At the same time, the Sub-Committee holds to the view that content **is** important and that it should, for example, be relevant to the lives of the students in the real world which they currently inhabit. It should be significant, or worthwhile knowledge. It is considered by the Sub-Committee that geography provides situations of this type, where the skills, values and attitudes of the students may be given the opportunity to develop with respect to questions, issues and problems of genuine

FIGURE 1

A MODEL FOR UNIT PRODUCTION

CLARIFYING OBJECTIVES

PLANNING SEQUENCE

THE LEARNERS/TARGET GROUP
age, previous learning, match and progression

TIMING
-when to be taught?
-what time is available?

TOPIC, ISSUE OR THEME

THE GENERAL AIMS OF THE UNIT

MORE SPECIFIC OBJECTIVES

KNOWLEDGE
specific information

generalisations arising from the enquiry

SKILLS
communication
language
intellectual
practical
social

VALUES
clarification of range of values impinging on the topic, issue, theme

personal appraisal of student's own values and attitudes in the light of her/his enquiries

INTERNATIONAL CHARTER COVERAGE
NATIONAL CURRICULUM COVERAGE
CONSIDERATION OF - CROSS-CURRICULAR POTENTIAL, LANGUAGE, ENVIRONMENTAL EDUCATION, CITIZENSHIP

USE A ROUTE FOR ENQUIRY	TO POSE KEY QUESTIONS
OBSERVATION/PERCEPTION	What do I observe/perceive? How do others view it?
DEFINITION/DESCRIPTION	What is the key question which emerges, or what is the issue to be studied?
ANALYSIS/EXPLANATION	What processes are involved?
EVALUATION/PREDICITON	What might happen next? What are alternative viewpoints/solutions?
DECISION MAKING	What decisions might be/should be made?
PERSONAL RESPONSE	What is my personal response? How may I justify my views? What action, if any, should I take?

USE THE KEY QUESTIONS TO DEVELOP AN ENQUIRY SEQUENCE, ASKING "HOW MIGHT THE STUDENT(S) INVESTIGATE THIS TOPIC OR ISSUE"

EVALUATION PROCEDURES, INCLUDING ASSESSMENT WHERE APPROPRIATE

CONSIDER THE ACTIVITIES AND RELATIVE ROLES OF THE LEARNER(S) AND THE TEACHER(S)

CONSIDER THE NATURE OF THE STUDENT ENQUIRY ON A CONTINUUM FROM CLOSED/TEACHER LED TO OPEN/STUDENT LED

CONSIDER NEED FOR FURTHER LEARNING/REINFORCEMENT

significance in the world today, with important implications for the quality of environments and for the quality of life.

The final box on the bottom left of the model, draws attention to the importance of relating planning to the advice provided by the IGU's
International Charter on Geographical Education (IGU 1992) and to the requirements of the general curriculum, usually a national, or system wide curriculum, within which the work will be taught.

The right hand side of the model, focusing on a planning sequence, suggests that a route for enquiry should be used to draw attention, during the planning of materials, to key elements of enquiry as used in geography, from observation and perception, through definition, description, analysis, explanation, evaluation, prediction and decision making to a personal response. This route for enquiry is further clarified by a set of key questions, related to each element of the route and suggesting a broad framework for enquiry which should be followed by the students.

This provides only a broad framework and, for specific topics, students would transform these key questions into more focused questions relating to the specific topic in hand. For example, if the topic is the study of the local area for a class of ten to eleven year-olds in a North London suburb, the teacher and the class might want to focus in on the issue of whether the high street shopping area should be pedestrianised. In this case, the key questions might run as follows:

> **What do we notice about the amount of motor traffic (traffic density) in the High Street? How does this affect shoppers? What do shoppers think about it? What do shop keepers think about it?**
>
> **Should something be done about the traffic problem in the High Street?**
>
> **What would be involved, for example, in turning it into a pedestrianised area?**
>
> **What might be the results of doing this,**
> **a) on traffic?**
> **b) on pedestrians?**
> **c) on the shop keepers?**
>
> **Should the High Street be pedestrianised?**
>
> **What are my views on this question?**
>
> **What action can I take?**

The key questions are then used to plan a teaching and learning sequence which will involve the students in active enquiry into the issue. At this stage too, the evaluation scheme for the unit should be considered. In the case of the example given above, for instance, the views of shoppers and retailers in the High Street might be obtained with respect to the unit, its aims, objectives and outcomes. Assessment of student attainment may form an important element of the evaluation.

Thought should be given to the relative roles of the students and the teacher(s) in the course of the unit. What activities are to be undertaken by the students and what will be the role of the teacher? This is linked to the next entry in the model, which suggests that thought should be given to the nature of the enquiry. This may vary from enquiry that is closely led by the teacher to that where students take a

leading role in making decisions about the nature, style and execution of the enquiry. Finally, consideration should, we suggest, be given to the need for further learning and for reinforcement of important ideas and skills developed during the course of the unit. This last recommendation is closely related to the planning of the evaluation scheme for the unit.

The model should not be seen as a tightly constraining route, but rather as a framework within which effective planning may be undertaken. It is important that teachers should feel they have the flexibility which will enable them to make the best use of, for example, the local situation, the context within which the students are learning and the special interests, experience and ability of the teachers involved.

The teaching materials

Working within the framework of this model for production of teaching materials, the members of the British Sub-Committee have been developing a set of materials on Berlin. It is thought that these materials will help to enhance European awareness and understanding at school level and elsewhere, for example through teacher education. It was planned that the materials would be relevant to the National Curriculum in England and Wales, at least as this curriculum stood before the review undertaken in late 1993 and early 1994, linking to studies of the European Locality and European Country. It is felt that this will provide an example of how the work may be geared to official curriculum outlines in other countries and contexts. Cross-curricular themes, such as, for example, Citizenship, Economic or Industrial Understanding, the European Dimension and Environmental Education, are being introduced where they are appropriate. A series of key concepts will run through the materials, including, for example, the concept of 'change' and the ideas included in 'similarities and differences'.

The exemplar materials will be appropriate for a wide range of ability in the age range 5 to 16 and we plan to provide examples of how materials may be approached and developed at various points within this age range. In addition to dealing with appropriate knowledge and understanding, the work will exemplify the potential of geography for enabling the development of a wide range of skills. It will also demonstrate the significance of values education through geographical study and provide the opportunity for values enquiry. The role of geography in environmental education will be exemplified.

The materials focus on the following questions:

>**Where is Berlin and why is it there?**
>**(Site and situation of Berlin: the physical context);**
>
>**How did Berlin develop and grow?**
>**(Historical growth and development of the city: the impact of physical conditions and the impacts of landforms and ecosystems);**
>
>**How has Berlin changed since the removal of the wall?**
>**(Changing growth and infrastructure);**
>
>**Transport - road, rail, air - the barrier of the wall and its removal. How has the situation changed?**
>**(Transport geography);**

Who lives in Berlin?
(Population geography, migration, change);

What is it like to live in Berlin?
(Social geography of Berlin);

A family in Berlin - some Berlin families.
(Case studies of a family or families);

What is it like to work in Berlin?
(Industrial and commercial geography of Berlin - changing dimensions - case studies of workplaces);

How does Berlin compare with our own environment?
(Contrasting Berlin with one's own environment and with other environments - similarities and differences);

Would you like to live in Berlin?
(Environmental evaluation).

At the time of writing this paper (March 1994), the materials are being produced in draft, following a research period during which various members of the Sub-Committee travelled to Berlin to undertake fieldwork and meet colleagues who had expressed an interest in the work. It is hoped that substantial elements of the work will be available for exhibition at the Meeting in Berlin in August 1994. It is intended that the materials will be trialled in British and German schools before publication.

Conclusion

The British Sub-Committee anticipates that there will be important outcomes from this work. For teachers, outcomes will include:
- a model of teaching material production which will provide guide lines on the planning, resourcing, teaching and evaluation of a teaching unit;
- an exemplar of the model in action;
- a set of teaching materials on Berlin, mainly in English, but with some elements in German (e.g. on maps, in data, in references, in quotations etc.).

For geography educators involved in initial and in-service courses for teachers, the project will provide the model and the exemplar materials for use in workshop activities and for adaptation and use in distance learning.

For Europeans, the project provides an example of co-operative endeavour with the potential for an important contribution towards European awareness and understanding.

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INTRODUCING EUROPEAN AWARENESS
INTO
PRIMARY PHASE GEOGRAPHY

William E. Marsden

Introduction

Negative British responses over a long period of time to the prospects of a "Channel Tunnel" have been regarded at home and abroad as a continuing symptom of insularity. There were a number of proposals to build a tunnel in the century before World War I, all strongly opposed in Britain, chiefly on militery grounds. During 1906, such a proposal inspired e teaching scheme for schools on "The Channel Tunnel" in an educational journal, The Practical Teacher. Here, as the clinching illustration in an extremely uneven consideration of pros and cons, it was suggested that, far from promoting the entente cordiale, a surplus of cordite at the British end would be matched by an absence of cordialite at the other (see Marsden, 1990, pp.122-3).

In a more critical earlier discussion, however, the geographer, Professor Boyd Dawkins, suggested that the post-Ice Age breach from the continent had had "a very great effect on the national character and, as it seems, not altogether a good effect". He argued that commercial arguments outweighed military, and also drew attention to national attitudes. What had made us British in our views had also made us "more or less Philistine ... shut off from other men ... in the position of Pharisees, looking on ourselves as better than other men." (Dawkins, 1891, pp.81-2).

It would certainly not be true to suggest that geography texts, at least in the secondary school, neglected the European dimension in the three-quarters of a century prior to Britain's acceptance in the EEC. Thomas Pickles's secondary school text, Europe, (1932) certainly saw Britain as part of a European community of nations, with common and seen as deserved interests in the colonial sphere:

> "."the European has not been content merely to develop his own lands ... the white man has with the irresistible 'drive' of his energetic expansion discovered for himself, opened up, and then taken under control, all the continents of the world." (p.1)

Pickles carefully added that this did not mean peoples of other races were "necessarily inferior", and that Europe was not the only part of the world where great things were achieved, but "we may reasonably ask ourselves how our small continent has been able to gain its present outstanding condition". (p.2)

Pickles's *Europe* (and there were many other textbooks taking a similar approach) offers a cautionary tale, therefore, in that there could well remain an underlying European pan-nationalism today, potentially as subversive of the promotion of international understanding as the nationalistic geographies of particular nations of an earlier era.

Moving forward in time, there was a considerable flurry of educational interest in European Studies in the build-up to Britain's entry into the EEC in 1973. This interest coincided with the comprehensivization of English secondary schools, accompanied by a switch from separate subject syllabuses to integrated syllabuses. The combining of geography, history and modern languages was a popular form of integration as a means of getting to grips with the European dimension. The developments of this period are well summarised in Williams' *Teaching European Studies* (1977). One negative aspect of the development was that European Studies often became an alternative targeted at less-able pupils who were experiencing difficulties with modern languages, and thus acquired a low-status reputation. In consequence, it was poorly resourced.

Meanwhile, secondary schools (11-16 or 11-18) which continued with separate subject timetabling, also took account of the European dimension (Williams, 1984). This was particularly the case in geography, history and modern languages, as outlined by Goodson and McGivney (1985). Their clear preference was for a coherent and sequential "Europe across the Curriculum" structure in which the disciplines brought to bear their offerings within a European Studies framework, rather than a structure in which a European dimension was permeated into particular subject areas such as geography. The choice of a subject framework for the National Curriculum in England and Wales in 1988 effectively undermined integrated syllabuses.

In primary schools (5-11 in England and Wales), the failure of campaigns in the 1960s and 1970s to establish modern languages in this phase no doubt militated also against the promotion of European Studies. In addition, progressive child-centred thinking tended to emphasise the importance of direct rather than indirect experience, and to sideline activities that were distinctively within the province of subjects such as history and geography, that is the distant past and the distant place ... Younger children were to be cocooned from outside world issues, as part of an ideology which polarised the child-centred and society-centred (Alexander, 1984, p.31) as well as child-centred and subject-centred.

The 1980s: Government Intervention

The Schools Council, a government-financed curriculum development agency, which had long fallen foul of officialdom and by the 1980s was on the brink of extinction. (see Derricott, 1994), in a parting shot attacked this limited thinking. It argued that primary teachers should focus on "the most pressing issues of the 21st century" (1983, pp.29-30). While official documents from the then Department of Education and Science were still at this stage promulgating an integrated "areas of experience" approach to curriculum organisation in which, for example, European Studies would have been part of "social, cultural and civic studies", by the time of the Education Reform Act of 1988, the government had become committed to a subject-centred curriculum for the 5-16 age range for all state schools in England and Wales.

It was thus left to the subject working groups, which the government set up to work out the new curriculum, to permeate a European dimension. In his brief to the Geography Working Group, the Secretary of State for Education pointed out that the subject bore a heavy responsibility "for environmental education and the European dimension in education, both of which are the subject of Resolutions of the Council of Ministers of the EC to which the UK is a party." (Baker, 1989, p. 87).

In the event, later Secretaries of State progressively marginalized attempts to introduce European awareness particularly at primary level. Thus there were to be no compulsory history study units involving a 20th-century European dimension in the primary phase. It was decreed that, as far as the school curriculum was concerned, history stopped in 1964. After that modern issues relating to Britain and Europe became politics, so could not be considered in history. In geography, at least the Working Group suggested a detailed and compulsory European locality study. But this too was watered down by the Secretary of State at a late stage in the discussions, in such a way as to make it peripheral at primary level.

Similarly the official cross-curricular document on *Education for Citizenship* (National Curriculum Council (NCC), 1990), which might have been expected to lay some stress on the European dimension, in effect mentioned it in passing rather than as a central focus of the exercise. The NCC was far more energetic in promoting traditional civic and national aspects of citizenship, such as "the citizen and the law". It was later made clear that in the cross-curricular areas in particular, government ministers were hostile to the more progressive and 'political' thinking they perceived as endemic in cross-curricular studies (Graham and Tytler, 1993, p.105) In sum, the official thinking at the time of the introduction of the National Curriculum was a throwback to the attitudes of insular nationalism criticised by Professor Boyd Dawkins about 100 years previously. It is interesting that a recent Council of Europe Teachers' Seminar expresses reservations about the different connotations given to the term "citizenship education" and prefers what is in the British context a narrower and more old-fashioned term, "civic education". (Council of Europe, 1992) It must be stressed, however, that while there has been much official back-tracking, there remain in the National Curriculum many opportunities for committed teachers to pursue the European dimension in the numerous cross-curricular interstices that exist. (Convey, Greasley and Winter, 1993)

The EC Dimension

Negativism about Europe has not, of course, been characteristic of all those engaged in official policy-making. Within the Conservative, as in other political parties,have been forces committed to involving Britain more fully within the European Community. Considerable pressures to internationalise thinking about Europe in the primary curriculum were evident also in the 1980s. Thus the Council of Europe's Council for Cultural Cooperation sponsored a project on primary education in western Europe which set up a dialogue on a wide range of aspects of primary education, based on case studies from contact schools in different countries, and included cross-curricular issues looking, for example, at multi-cultural education, and the extension of the European dimension in primary schools (Galton and Blyth, 1989, pp.1-5).

The other body promoting moves towards common policies on the European dimension, from primary school level upwards was, of course, the Commission of the European Communities. Relevant resolutions of the Commission on education have been those of 1976 and, more particularly, of 1988. Following the Single European Act of 1986, the EC Council and the Ministers of Education adopted a Resolution which had the intention, among other things, of strengthening a sense of European identity, of preparing young people to take part in the social and economic developments in the Community, of improving their knowledge of the Community

and its member states in their historical, cultural, economic and social aspects, and of informing them of the significance of the cooperation between those states and the other countries of Europe and of the world. The last resolution is crucial in ensuring that nationalistic curricula of individual countries do not become the pan-nationalistic curricula of the European community countries, and that the European dimension in education is seen as part of the larger issue of education for international understanding. (Wiegand, 1992, p.12: see also IGU Charter, 1993)

The 1986 Single European Act was approved by the British parliament in 1989. The Treaty of Maastricht of 1991 included articles on education which, among other things, fostered cooperation on a broad range of ideas, including developing the European dimension. A Council of Europe Resolution of 1991 reinforced this thinking. Like the EC Resolution, it emphasised that promoting a European dimension was to be done without losing sight of global responsibilities, or of national, regional and local roots. The European dimension is indeed conveniently placed between local/regional/national study on the one hand, and global on the other (Knight, 1993, p.115).

In Britain, one positive initiative in promoting European awareness in schools has been the UK Centre for European Education (UKCEE) (see Williams, 1992). And while, as we have seen, there has been less than official enthusiasm for advancing politicizable aspects of the curriculum such as European Studies, at the level of government rhetoric at least, responses have been made to its responsibility for promoting a European dimension that emanates from the Single European Act and from Maastricht. The British government published a statement of its policy for incorporating the European dimension in education, and listed the following aims:

-   helping pupils and students to acquire a view of Europe as a multi-cultural, multi-lingual community which includes the UK
-   encouraging awareness of the variety of European histories, geographies, and cultures
-   preparing young people to take part in the economic and social development of Europe and making them aware of the opportunities and challenges that arise
-   encouraging interest in and competence in other European languages
-   imparting knowledge of political, economic and social developments, past, present and future, including knowledge about the origins, workings and role of the EC
-   promoting a sense of European identity, through first hand experience of other countries, where appropriate
-   promoting an understanding of the ECs interdependence with the rest of Europe, and with the rest of the
    world. (DFE, 1993)

The document goes on to specify the role of subjects such as geography and history, and also links with cross-curricular aspects such as environmental education and education for citizenship. It accepts that the European dimension is more than just about knowledge of Europe (see Shennan, 1991, p.69). The gap between this promotional government rhetoric and current official stipulations for the National Curriculum is on current evidence, however, considerable.

The Cognitive Framework

A cognitive framework for the study of Europe needs to define what is meant by the concept of Europe, which is clearly more than just a set of territories with a set of distinctive histories. It also has critical cultural connotations. Does it in fact have recognisable common culture? Discussion of this issue could take up a whole book. For now, let us use Jordan's definition which offers a geographical slant.

"Europe is a human entity and its distinctiveness is to be sought in the character of the peoples who occupy it. Europe is a culture which occupies a culture area. Culture may be defined briefly as a community of people who hold numerous features of belief, behaviour and an overall way of life in common, including ideology, technology, social institutions and material possessions. A 'culture area' is any large area, usually contiguous, that is inhabited by people of a particular culture, a land on which the visible imprint of that culture has been placed." (Jordan, 1973, pp.2-7)

The traditional historical slant, which sees European culture today as the culmination of a heritage derived from Graeco-Roman civilization, enhanced by Christianity is, surely correctly, treated sceptically by Shennan and Lawrence (1980, p. 29)

Once the concept of Europe has been accepted as a distinctive and comprehensible dimension of study and, having borne in mind the intentions of the official European resolutions and articles pertaining to education , previously cited, it is useful to lay down a framework of aims and subject matter aims, within which different disciplines or inter-disciplinary arrangements can frame their contributions. Shennan and Lawrence again are helpful here:

- to study the multi-disciplinary concept of Europe through a number of disciplines
- to explore this concept through its geographical, historical and cultural dimensions
- to appreciate those distinctive features which have given Europe an identifiable cultural unity
- to understand at the same time the strength of European diversity
- to appreciate the evidence for and the significance of continuity within European civilization as expressions of common human needs that underlie cultural and sub-cultural differences
- to understand that Europe has always been a centre of change and innovation and to appreciate the implications of this (p.35).

Added to this are a number of course aims, including the promotion of pupil understandings, self-awareness, tolerance and impartiality, and motivation to study, involving the laying of the intellectual foundations for the acquisition of interests, pursued through the medium of experience of the various peoples and places which make up the European civilization of which they are a part. (p.36) Clearly this must be seen explicitly in the broader context of a programme of the fostering of international understanding.

Promoting the European Dimension at Primary level

As Bell has emphasised, much of the focus on the European dimension in schooling in England and Wales remains at the secondary school level, a situation not necessarily changed by EC Resolutions. Through early neglect, he argues, can be fed "the fatal tendency to generate rhetoric from grand designs, for attitudes and values

are formed in primary schools and by the families of pupils" (Bell, 1991, preface). Leaving the introduction of a European dimension to the secondary level is therefore like shutting the door after the horse has bolted. (see Carnie, 1966). The DFE document, at least at the level of principle, does not close this door, pointing out that while teachers of young children might see the European dimension as having less relevance than for secondary pupils, there are "successful and exciting examples of introducing Europe to young children" (DFE, 1993, p.16).

Case Studies of Primary Education in the European Dimension

Many local education authorities, as well as individual schools, have produced materials helping primary teachers to develop programmes of European study. Some of these, such as the Cheshire and Avon LEAs, have helped to establish twinning arrangements between schools in England and on the European mainland. Avon's *School Links International* (Beddis and Mares, 1988) went well beyond Europe, to encourage linkages round the world. The school indeed is an invaluable connecting agency, particularly at primary level. Drawing on European examples, Marsden has suggested ways in which empathy can be promoted through using the world's primary schools (1988)

Despite much official lack of encouragement, the Department for Education and Science have financed some work on the European dimension. This forms the first of a number of initiatives outlined below.

Materials 1

The Department for Education Pack: "Education Europe"

While most of the thrust of this pack is towards secondary level, it is symbolically important as a tangible expression of the Department for Education's involvement in a European dimension. At the same time, it does contain some useful background material on the EC for the primary teachers, including a chart which identifies links between the European dimension and the various subjects of the National Curriculum, in this case in geography, history, English, art, music, technology and modern languages. The pack also contains materials from the Central Bureau for Educational Visits and Exchanges, including a whole series of examples of school and curriculum connection between different European countries.

The Shell Education Service Pack: "Europe in the School - the School in Europe

This pack, the work of Bell and Dransfield, is specifically geared to the 8 to 12 age group, and includes advice to teachers on developing action plans for the European dimension, a European database for teachers and no less than 81 activities for pupils, relating to all the subjects of the National Curriculum and also the cross-curricular themes: environmental education, careers education, education for citizenship, health education, and education for economic and industrial understanding. The pack includes an audio-tape "The Sounds of Europe".

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European Association of Teachers (UK Section): "European Awareness in the Primary School"

Written by D.O. Butcher, this production offers checklists of what primary children should know about Europe, teaching materials, how to deploy the topic approach, and includes a series of teaching schemes and associated activities. Topics particularly favoured in European awareness programmes are transport, leisure, and environmental issues such as water. The role of history and geography, and art and language, in contributing to European awareness is stressed.

Geographical Association: Contributions to Primary Geography

Since the introduction of the National Curriculum in 1988, the Geographical Association in Britain has made major efforts in promoting geography in the primary school (Morgan, 1994), including the production of a dedicated journal, Primary Geographer. In the second edition of this, a group of teachers described a geography-focused topic entitled "Into Europe through Holidays" (Blackburn, et.al, 1989), concentrating on routes and leisure activities. It is also represented in Speak and Wiegand's International Understanding through Geography (1993). The European dimension has also figured in Geographical Association primary days at annual conferences, with sessions on European awareness offered and written up by Nicholson (1991 and 1992). Her papers supply a range of ideas and advice, including addresses for acquiring resources on Europe and its various countries, and cross-curricular connections.
Among the strategies for "feeling one's way into Europe" Nicholson identifies:
- Focus, through maps, pictures and plans on distinctive geographical features
- People, ideally using named individuals and families as a basis for linkages, stressing personalization of the geography
- Children in particular, as a means of identifying similarities and differences in life-styles
- Sense of place, through, for example, photomontages, comparing the small detail of house design, textures, and other observable features
- Map the place concerned, show it in its spatial relations, how to get there, etc.
- Comparative aspects of real life such as
  - food
  - going to school or work
  - going to play
- Awareness of change, both in other places being studied and the home area
- Connections between daily living at home and European awareness, e.g. road signs, recipes, European words used, shops, etc.

Geography INSET Primary Project: with Teachers to Barcelona

The Geography INSET Primary Project (GIPP) in the University of Liverpool's Department of Education has worked with five local education authorities (Cheshire, Cumbria, Lancashire, Shropshire and Staffordshire) in coordinating a large-scale, government-funded in-service programme in geography for over 140 primary school teachers. A significant part of the 20-day course was the arranging of a 3-day field studies visit to Barcelona in October 1993 with the dual purpose of providing the opportunity to develop detailed locality and thematic studies to cover requirements

of the National Curriculum, and also of building up European awareness through insights into this great centre of European culture, in its Catalonian setting.

Funding for a preliminary pilot study came from the GIP project and from the Central Bureau for Educational Visits and Exchanges. Financing for the field-study visit of the large body of teachers came out of the government grant for the 20-day course: one of the more valuable parts of its efforts to provide support for the implementation of the National Curriculum in different subjects.

The following detailed field- study units were offered:

a) **Within Barcelona**
  (a) Montjuic hill (historic defensive site)
  (b) The port of Barcelona
  (c) The old city (Ciutat Vella) and the 19th century outgrowth of the Eixample district
  (d) Inner city school catchments in the above areas

b) **Outside Barcelona**
  (a) Viticulture in the Vilafranca del Penedes (focusing on the Torres winery at Pacs)
  (b) Resort studies/ coastal scenery (Blanes or Sitges)
  (c) Montserrat - physical geography/leisure use.

The geography-led focus of the experience is fairly obvious, but equally opportunities were opened-up to make cross-curricular links, for example with history, art and economic and industrial understanding. In particular the critical importance of placing the visit in the context of developing European awareness was stressed, both in the preparation, the visit and the follow-up. For example:

(i) in advising on reading materials, including Robert Hughes's brilliant history, entitled Barcelona.(1992)

(ii) in work associated with Catalan language and culture, especially related to Gaudi, Picasso and Dali, whether in raising awareness in preliminary sessions, in the experience of visits while in Barcelona (to, for example, Gaudi monuments), or in the consolidation of follow-up work, linking geography and art

(iii) in links with religious education in the visit to Montserrat, of considerable symbolic significance in Catalonia.

(iii) in combating, through multi-media presentations, stereotypes of Spain, including a session contrasting musical stereotypes of Spain from non-Spanish composers, with indigenous music.

(iv) in the collection of memorabilia going far beyond, on the one-hand, geographically-focused materials and, on the other, general exotica

(v) in placing Barcelona and Catalonia, and their associated political aspirations, in the context not only with Spain, but also of Europe.

The follow-up work for teachers included not only teaching schemes for their schools, but also formal assignments, accredited by the University of Liverpool.

Conclusion: The European Dimension and International Understanding

To repeat: it is of vital importance that in pursuing the goals for education laid down in resolutions from the official organisations of western European countries we pay special attention to those which relate to the placing of the present European

Community (largely the West European community) not only in its larger broader European frame, but also the global setting. Enthusiasm for European Community links in a narrow sense can become merely an extended form of nationalism. It can also be unnecessarily bureaucratic. One small example of such constriction, for example, is that in the present National Curriculum in England and Wales, schools can select a detailed locality study of a French or German winter sports resort, but not of an Austrian or Swiss one.

Just as the aims of European Community and Council of Europe Resolutions for education should inform and even over-ride those of national aims and objectives, so those of, for example, the International Geographical Union Commission on Geographical Education's *International Charter on Geographical Education*, based essentially on global human rights values, should inform and even over-ride those of what are, again, largely western European organisations. The tensions should not be difficult to resolve, but it would be guileless not to recognise that they are present. Children should not emerge from schooling more aware of what comes out of Brussels than what comes out of Geneva or New York. It surely should be regarded as highly apposite that the IGU meetings of 1994 are in Berlin and Prague, and that opportunities for outward drift from the current over-concentration on the geographies of western Europe should be taken.

In detail, an important element to be scrutinised in new Europeanised geography or European Studies syllabuses, is that new forms of stereotyping are avoided. It is always easy to interest children in exotic differences. Thus too many of the integrated European Studies courses in Britain in the 1970s, linking geography and modern languages, while disdaining such anachronistic caricatures of France as a land of frog-eating, bad plumbing, and doubtful morals, appeared to concentrate over-heavily on wine, cheese and small-town shops and markets, when not on visits to Paris. Similarly, some of the new advice for primary schools could bring a too heavy dependence on travel and leisure as dominant topics, engaging as these might be for younger children. Thus the Barcelona visit described above was deliberately designed to include far more than the coastal tourist strip, and to provide a balanced overview of the Barcelona region..

More generally, it must be recognised that impositions from above, whether from the Department for Education in London, or European organisations in Brussels and Strasbourg, when disseminated, can carry the same top-down connotations, and meet grass-roots resistance. In England and Wales, there is no evidence that primary teachers are hostile in principle to introducing a European dimension. But in practice the government has demanded the achievement of what it sees as higher-order curricular priorities before cross-curricular dimensions such as European awareness are addressed. Pressure on cost,time and human energy could freeze-out such wider initiatives. The cliche of rhetoric versus reality has unfortunately much practical evidence to support it. Thus, as we have noted, in England the Department for Education has produced a positive and forward-looking statement in advising schools, colleges and local education authorities how to develop and implement policies for the European dimension in education. That is the rhetoric. Yet at the tangible level, a struggle is in progress to maintain as a priority a European component in the geography syllabuses of primary schools. Hopefully the promising initial surge of twinning arrangements and other European exchanges and linkages (Hughes and Paterson, 1994) is now too well established, albeit in a minority of schools, to be undermined.

To conclude with the views of an infant teacher who was a member of the North-west Consortium Group which undertook the field study visit to Catalonia, and who placed her follow-up to the experience quite firmly in the broader European dimension.

"The teaching of a European locality does not appear in the geography National Curriculum until Level 5, (that is the highest 'Level' for the primary school phase) but I would argue that we have a responsibility to teach European, and wider world, awareness much earlier, as a theme which permeates the whole curriculum ... Making connections between the child's experience and the world of the unknown is the key here. Through identifying those factors which we have in common, such as play, school, home life and interests, we can progress to explore diversity, as in diet, language, art and beliefs." (McGrath, 1994)

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EDUCATION FOR PEACE
OR CONFLICTS IN THE NEW SWEDISH CURRICULA?

Margit Werner

Abstract

The analysis of the new Swedish curricula together with preparatory papers and bills shows that education for peace might also have education for conflicts embedded. Teacher training must counteract this.

Peace is of vital importance to all people. Food, health care and education are basic needs, but without peace they are very seldom fulfilled.

Can you educate people about peace, teach about peace? What does peace mean? Sometimes perhaps freedom is more important than peace?

John Fien in Education for Peace through Geography (1992) elaborates on different questions concerning peace education, types of peace, peace work and how you could use an across-the-curriculum approach to education for peace.

Recently Sweden got a new national curriculum for 1-12, divided into two parts, one for the compulsory school system the other for the upper secondary level (gymnasium). There are also new curricula for different subjects. The final work has been going on for about two years.

At the same time there is a war going on in former Yugoslavia, there are wars and uprisings in different parts of the former Soviet Union, conflicts in South Africa, nazi-groups forming in Sweden as well as in other parts of Europe, assaults on immigrants and refugees in Sweden.

The national curriculum and the different subject curricula - are they formed to manage problems like the ones presented above? Are they pointing at the possibilities of education for peace or even demanding peace education? Or, are they tending towards a conflict creating education?

In analysing the preparatory documents and the bills regarding the different curricula I have found that the word PEACE is used only where international agreements and conventions, esp. the UNESCO Recommendation concerning Education for International Understanding, Cooperation and Peace is mentioned. But when looking for words, meanings and ideas in accordance with the UNESCO document and also with the International Charter on Geographical Education there are a lot.

The most important word in the national curriculum is democracy. Then comes ethics and environment. These are all basic themes. Next comes words like socio--spatial disparities, limits to growth, internationalisation and solidarity.

Looking at the geography curriculum - neither in the compulsory school part nor in the upper level part (for which I have been one of the expert advisers!) the word peace is mentioned.

But, there are a lot of words and sentences in agreement with the UNESCO document and the Charter, such as:

The education shall arouse and strengthen the student's interest and responsibility

for resource management and environmental managent both locally and globally ... The resources of the Earth are unevenly distributed ... There are no selfsupporting regions and the interdependence on production and consumtion, transports and contacts is increasing ... The population growth leads to obvious consequences esp. concerning differences in welfare in different parts of the world and an increasing consumtion of the resources of the Earth ... A regional identity is created through knowledge of the region, insight in its possibilities and understanding of its characteristics ... The knowledge of other regions in the world and in the interdependence between peoples and countries result in a better balance between regional identity and global understanding and solidarity ... Through geography the studens interest to know and understand the different living conditions for people will be fostered ... Thus, the subject increases the understanding and respect for other peoples' culture, values and way of living.

All these words and phrases are supposed to be peace related. But , as I see it, they could just as well be conflict related. Especially when they are put in connection with some other expressions in our national curriculum e.g "If we aim at maintaining our prosperity we must insist on the next generation Swedish students being the best educated ever." (bill 1992/93:250 p. 8) Well educated does not create conflict, but prosperity? Another point is the emphasis on our cultural heritage. It is important to have an identity- but in all papers analysed it is so very much emphasized. Still another point is the stressing of Europe. This does not mean conflict, but it means much less stress on other parts of the world, the parts needing our solidarity.

Why is it like this - and what can be done?
There is no single, simple explanation but

1/ There has been peace in Sweden for more than 100 years and we have, since World War II, seen very few real war time refugees until now;

2/ In the national curriculum and also in the different subject curricula there is a focus on consequences, thus it is you and the student himself who should realise what is going to happen when, if ...;

3/ The right wing political climate today in Sweden, as in many other countries, together with unemployment and economically less prosperous times together with the focus on Europe. These are three main causes.

To counteract these negative tendencies we need:
1/ students educated in critical thinking and in making analyses

2/ textbooks of good quality, esp. concerning the treatment of other cultures than the Swedish one. An important work by Lena Olsson (1986) shows that the ethocentric attitude still prevails in the Swedish geography text books, and that western culture is used as a norm. There is very little change and very little written about interdependence in the books of to-day (cf Werner 1992)

3/ teachers who are trained not only in geography but also in conflict studies; it is not enough that conflicts are dealt with within the subject social science, a compulsory subject for all students at upper secondary level.

Conclusions

This short overview points out the fact that even if there are good intentions in the different curricula the results could in a bad situation be the opposite, conflicts and no solidarity instead of peace.

– It is a challenge for the teachers at all levels in the 1990's and especially for educators involved in teacher training to work on counteracting all signs of what could turn into local as well as global conflicts.

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– Regeringens proposition 1992/93: 220 och 1992/93:250: En ny läroplan och ett nytt betygssystem för grundskolan, resp gymnasiet.

– Utbildningsutskottets betänkande 1994/94:UbU 1: Ny läroplan för grundskolan, m.m.

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DACHAU AND ITS NAZI CONCENTRATION CAMP: DEALING WITH A DIFFICULT PLACE AND PAST IN THE GEOGRAPHY CLASSROOM

Rudi Hartmann

The teaching of the Holocaust and the Nazi concentration camps continues to be an educational imperative. In particular, historians have tried to integrate this sad and gut-wrenching chapter in their teaching of high school and college students. It is maintained here that geographers also can play a part in these educational efforts and they are able to contribute to a better understanding. The purpose of this paper is to discuss ways to introduce the Nazi concentration camps from a geographic point of view.

In Dachau, the first Nazi concentration camp, and in many other camps that followed, millions of people were subjected to atrocities and innumerable tragedies. Teaching the subject matter involves the analysis of difficult places, controversial events and sensitive issues. It is first of all the personal background of the geography instructor and that of the students which sets the educational context. However, there are five general directions which the geographer can choose and/or emphasize to introduce the topic:

1) Political/Economic Geography
The following themes and topics could be addressed from a political and economic geography point of view:
- The locational decision for the first concentration camp in Nazi Germany (Why "Dachau" near the old market town of Dachau)
- The growth and change of the Nazi concentration camp system in Europe (from a few detention camps for opponents of the new 'Third Reich' to more than 20 main camps and a thousand subsidiary camps including several death camps — with "Dachau" spearheading the development and forming the "model" camp)

2) Population Geography
The following themes and topics could be addressed from a population geography point of view:
- Population growth and change in Dachau (1933-45), from the early stage (with a few hundred detained political prisoners) to the final stage (with 32,000 slave workers from about forty nations)
- Total population figures in the camp (more than 200,000 people passing through the camp) and registered death (31,951 deaths recorded)

3) Social Geography
The following themes and topics could be addressed from a social geography point of view:

- Social structure in the camp and the Nazi classification system (Who were the prisoners? How did the Nazis label the different social groups and where within the camp did they house them? Which prisoner groups were most influential and helped to run the camp through the years, at liberation and the first few months after liberation?)

4) Geography of Tourism

The following themes and topics could be addressed from a geography of tourism point of view:

- "Dachau" as a historic site, memorial and major tourist destination for millions of visitors since 1965 when a memorial site and museum was opened to the public (Who reconstructed the history of the camp? Who are the visitors to the memorial and museum? What are the motives of the visitors?)

5) Humanistic Geography

The following themes and topics could be addressed from a humanistic geography point of view:

- The meaning of "Dachau" and the perception of "Dachau" in the City of Dachau, in Germany and worldwide
- Dachau as a place to commemorate perished lives, to heal and to live

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EDUCATION FOR SUSTAINABILITY:
A NEW ROLE FOR GEOGRAPHICAL EDUCATION
IN AN ERA OF TRANSITION

John Huckle

Socialism encountered revolt because it failed to adapt. Adaptation and not a dramatic descent to primitive capitalism is now the need. It is an untrod road; it cannot be negotiated by adherence to rigid rules. It requires, alas, the painful processes of thought. that has in all economic ages been resisted, as it is being resisted now. There is, sadly, no alternative.

J K Galbraith, in Prins (ed.), 1990, page 11

This paper is an exercise in those painful processes of thinking which Galbraith considers necessary to guide the transition in eastern and central Europe (ECE) and prevent a descent to primitive capitalism.Its overall thesis is that those modern forms of social organisation and development which have dominated Europe for the past fifty years have failed but that emerging post-modern forms of organisation and development offer some prospect of more diverse, democratic and sustainable futures. The key challenge for the peoples of eastern and western Europe is to recognise the failures of social democratic forms of capitalism in the west and of state socialism in the east; assess the potential and threats of post-modernity; and adapt socialism to new realities. This will require a midway convergence between east and west and new forms of citizenship and citizenship education which can promote socially and ecologically sustainable forms of development. Geographical education can play a key role in developing such citizenship as local, national, and supranational governments begin to act on Agenda 21 (Quarrie, 1992).

Development and integration in western Europe

The period from 1950 to the mid 1970s was an unprecedented era of sustained growth in the major capitalist economies of the world. During this "post-war boom" societies in western Europe followed those in North America in adopting Fordism; a model of development based on a distinctive labour process, regime of accumulation, and mode of regulation (Armstrong, Glyn & Harrison, 1991, Lipietz, 1992). Sustained rates of growth, profit and investment resulted from favourable material and institutional conditions. There were reserves of labour power, cheap raw materials and energy, and technological innovation to draw upon, and there was a stable international financial and trading system regulated largely by the USA. This era saw the emergence of multinational industrial and financial corporations as new technologies allowed their managers to overcome frictions of distance, social organisation, and culture. New forms of communication, labour relations, and "cultural

industries" facilitated changes in the scale, sophistication and interdependence of the world economy to such an extent that globalisation began to threaten the autonomy and legitimation of nation states.

The rise of global interdependence, or the consolidation of a world system of combined and uneven development, means that nation states must review their priorities or face isolation and relative decline. Integration with other states offers economies of scale, enlarged markets, stronger regional interaction through freer movement of labour, goods and capital, and greater bargaining power with respect to international capital (Knox & Agnew, 1991). At the same time it involves a loss of sovereignty and a possible widening of social and regional inequalities as a result of uneven and combined development within the larger whole. The European Union is an example of formal supranational integration and while its project of greater economic and political union stalled in the 1960s and 1970s, it was renewed in the 1980s in response to the worsening supply and demand side crises of European capitalism.

The Luxemborg compromise of 1966 meant that the European Economic Community developed as an intergovernmental rather than a supranational operation (Ross, 1992). Its members sought only predictable and expanding trade within the overall system of US hegemony, and there was little demand for the transfer of regulatory activities from the national to the supranational level as long as the post-war boom continued. By the 1970s however it was clear that the material and institutional conditions which had enabled this boom were becoming exhausted. The ecological, economic, political and social "limits to growth" were increasingly apparent and national systems of Fordist development were threatened, to a greater or lesser extent, by falling profitability; the globalisation of production, finance and markets; increased levels of worker alienation; increased costs of reproducing such conditions of production as natural resources and services; citizens' demands for more real democracy; and a breakdown in US hegemony and the associated mode of global regulation. European capitalism faced a supply side crisis as Fordist labour processes and modes of regulation were unable to sustain rising levels of labour productivity, product quality, and technological innovation. It also faced an associated demand side crisis due to the failure of Community leaders to pursue greater economic and political integration and thereby establish forms of supranational regulation which could prevent economic paralysis and competitive stagnation.

The rise of post-Fordism and post-modernism

To overcome its supply side crisis and restore levels of profitabiity European capital embarked on a period of restructuring which represented a break with Fordism and a move to a new post-Fordist model of development. Post-Fordism uses new technologies to obtain greater flexibility, with respect to production, labour, and markets, and to quicken rates of innovation and capital circulation. It involves a vast array of new products and services and a degree of decentralisation and democratisation as firms reorganise spatially and adopt new forms of labour relations (Allen, 1992).

More flexible and diverse forms of work, production and consumption, are reflected in political, social and cultural change. Post-Fordism fractures society, bringing new status and class divisions along with new interests and insecurities. Consequently the old politics related to work and economic production declines, and a new politics emerges in which issues of consumption take on greater significance.

While post-Fordism fragments and decentralises, trends towards global interdependence and integration continue. The new social movements reflect issues and problems which globalisation intensifies and highlights while the increased significance of locality, local issues, and local politics, reflects both the legitimation crisis of nation states, whose power and autonomy is undermined by globalisation, and the desire of individuals to find some stability and security in a profoundly disorientating world. Lifestyle, like locality, also becomes an important site for politics and self expression with the retailing and cultural industries offering a range of new products (Hall, Held & McGrew, 1992).

The cultural impact of post-Fordism is to produce new aesthetic, cultural and intellectual forms and practices which are labelled post-modernism to distinquish them from the cultural styles and movements which dominated the first half of the twentieth century. Post-modernism reflects and shapes an economy in which knowledge is power and a bewildering array of knowledge and cultural forms are the key to new and usual commodities which can be sold for profit. It revels in fragmentation, ephemerality, and discontinuity; brings a new sensitivity to difference and subjectivity; replaces high brow culture with popular culture and consumerism; and suggests that there are no metalanguages, theories, or grand narratives via which all things can be connected, represented, or explained.

The nature and growth of post-Fordism and post-modernism is socially and spatially variable across western Europe and it affects people, communities and regions in different ways. The continuities and discontinuities between Fordism and post-Fordism are a matter of much academic debate but all people and places are shaped by processes of combined and uneven development as an older form of social organisation and development gives way to the new (Leadbeater, 1989).

Towards closer integration in western Europe.

After a period in which member states adopted different approaches to demand side problems, the project of full economic and political union was revived in 1985. It offered multinational capital a single market and economies of scale; the removal of uncertainties resulting from floating exchange rates; and the prospect of a European free trade zone open to world markets. Supported by neo-liberals on the new Right this scenario was not that intended by Jacques Delors and his supporters on the Left. They believed that after removing national systems of regulation, which had largely caused the crisis, it would be possible to re-regulate at the European level. For these social democrats, Europeanization meant common macro-economic policies or full economic and monetary union; budgetry expansion and reform; the harmonisation upwards of environmental and social policy; and the devolution of power in an expanded Community to create a Europe of the regions. This progressive Europe would represent an 'organized space' between its nations and the global market and would offer a radically different development path than that likely to result from the free market Europe of the Right (Palmer, 1992). With adequate attention to appropriate restructuring of economic production, distribution and re-distribution, and to the extension of democracy, there was the genuine prospect that it could deliver ecological and social sustainability.

Negotiations over the Maastricht Treaty resulted in only weak forms of re-regulation since trade unions failed to back Delors at the crucial stage (Lambert, 1991) and Denmark, the most environmentally and socially progressive state, rejected it for

a time. The treaty failed to harmonize levels of capital taxation; introduced a much weakened social chapter; and contained no strong measures to democratize the Community's political institutions. Weak regulation brought the risk of a two speed Europe with high skill, high wage, economies in the core maintaining social rights and welfare while poorer, low skill, low wage economies on the periphery cut these back. Without a strong treaty and democratic institutions Germany's economic power and its monetary, fiscal and social orthodoxy, was likely to prevent a collective recovery. Europe would still enlarge but power would remain centralized and the associated re-division of labour would result in new peripheral zones characterised by social and environmental dumping.

In addition to weak regulation the European Union has a serious democratic defecit since policies which escape democratic control at the national level do not come under equivalent control at the Community level. The location of sovereignty varies according to the issue among localities, regions, national capitals, a Commission in Brussels vaquely accountable to a parliament in Strasborg, a closed confederal gathering of foreign ministers, and a committee of central bank governors. Political power is further masked by obscurity and elitism and the elected parliament has little or no power in some policy areas. While further democratisation is due in 1996, social democrats seek greater powers for the European parliament so that it has equality with the Council of Ministers in shaping legislation and the green Left seek a truly federal system of decentralised democratic control with decisions taken as close to the citizen as possible (Kemp & Wall, 1990). This would entail a written constitution, which would give the European parliament powers to elect and remove the President, and the evolution of a second revising chamber. Key decisions would continue to be made at the European level but democratization would allow the common interest in sustainable development to prevail.

The environment in western Europe

Environmental managment and planning was an integral part of those Fordist modes of regulation which prevailed in western Europe during the long boom. The state played an increasing role in the reproduction of the conditions of production (natural resources and services, rural and urban space, and human health and welfare) but its abiity to shift society to more sustainable forms of development, using such instruments as legislation, taxes, and environmental education, was limited by the imperatives of capital accumulation and the problems posed by mounting supply and demand side crises (Snaiberg, 1980, Johnston, 1989). Limited success contributed to the supply side crisis and provoked the emergence of environmentalism as a social movement. Some of its members realized in the late 1960s that the Fordist treadmill or production and consumption was not ecologically sustainable and began to propose alternatives which reflected a range of ideologies and utopias (Pepper, 1984, Dobson, 1990).

The decline of Fordism and the rise of post-Fordist economies has resulted in both promise and threats as far as the environment is concerned. Many of the old centres of mass production and pollution have closed down and the new 'sunrise' industries are generally cleaner and less materials and energy intensive. In those parts of western Europe where social democracy and strong regulation prevail the environmental impact of restructuring has often been for the good. In other places with new Right governments, areas of decaying Fordism show environmental dereliction and

decline while emerging areas of post-Fordism often display new forms of congestion, conspicuous consumption, and waste.

The environmental policies of the European Union have evolved over twenty years and originate in the desire for fair trade based on common environmental standards (DoE, 1992). The 1987 Single European Act gave the Community increased powers to legislate on the environment and the fifth action programme, Towards Sustainability (CEC, 1992, Collins, 1993), seeks to set the Union on the path to sustainability by the year 2000. Regulations and directives from Brussels are not always obeyed by member states but they are powerful levers which environmental groups can use to encourage reluctant governments to act. The process whereby such legislation is developed and adopted remains complex and undemocratic but the Maastricht Treaty did result in limited improvements. Community policy in other areas needs to be integrated with policies on the environment; the Common Agricultural Policy and Structural Funds should be reformed to promote sustainable development; and an independent environmental inspectorate should be set up to monitor and enforce standards. A Freedom of Information Directive and subsidiarity should be used to encourage local participation in environmental planning and the new Consultative Forum on the Environment should be properly resourced to allow full representation by environmental non-governmental organisations.

The Maastricht Treaty's advocacy of "sustainable and non inflationary growth" and Towards 2000's emphasis on new policy instruments suggested by environmental economics, hints that the Union seeks sustainable growth rather than sustainable development (Redclift, 1987, Pearce, 1993). Its programme is essentially social democratic and reformist and is criticised by both the Right which seeks to further de-regulate the environment and by the green Left which seeks a more radical programme. Green socialists recognize that neither social democracy in the west, nor state collectivism in the east, has delivered economic and political democracy. The majority of workers do not find their jobs satisfying; citizens are increasingly cut off from the real decisions which shape their lives; and environmental and social security is not assured (Seabrook, 1990).

Green socialism

An alternative green or third way to socialism (Barbrook, 1990) would involve a radical extension of popular democracy and the use of new technologies to provide emancipation from work rather than emancipation in work. A planned and regulated mixed economy would steer production in socially useful and sustainable directions and a redivision of labour, together with developments in the cultural sphere, would lessen the attractions of consumerism (Ryle, 1988, Dunkley, 1992). Andre Gorz (1989) suggests that red green politics is essentially a politics of time. Green socialists should use the opportunities offered by new technology to campaign for more work sharing, and a shorter working work without loss of pay, so that people can rediscover a world of autonomy where they can define themselves in associated with others and engage in play and self directed labour.

Green socialism reflects the radical potential of post-Fordism and post-modernism by suggesting that new technologies, together with new forms of politics, social organisation and culture, offer new possibilties for human liberation and democracy. It is aware of the utopian and reactionary leanings of much post-modern and green political thought (Atkinson, 1991, Eckersley, 1992) but offers a revised vision of

progress and a revised counter culture. These stress less quantitative and instrumental ideas of production, efficiency and progress; urge inter-generational equity as well as new forms of international humanism; and recognise the importance of diversity, subjectivity and locality to a contemporary politics which should also embrace culture and lifestyle (Pepper, 1993).

Green socialism gives radical expression to post-modern sensibilities and attitudes, allowing its hedonism to be translated into genuinely easier going forms of life. Bauman (1990) explains how liberty, equality and fraternity, the core values of socialism, were distorted under social democracy and state socialism, and how 'actually existing socialism's' commitment to industrialism often involved spectacular ineptitude and arrogance when converting nature to human use. He argues that post-modernism represents modern development coming to terms with its impossibility and urges socialists to take account of emerging social values, particularly those of liberty, diversity, and tolerance, and ensure that they are turned in progressive directions. Lambert (1991) is amongst those who detect an emerging coalition of political parties and social movements which is responding to this challenge within the framework of an emerging European federal system requiring further democratization.

Development and the environment in Eastern and Central Europe

In 1989 those forms of supranational integration which dominated eastern and central Europe (ECE) after 1945 fell apart. The Soviet Union and its satellites had persued their own versions of Fordism but had generally been unable to adapt their modes of regulation to allow a transition from extensive to intensive development and so keep pace with the West. Bureaucratic or state socialism took a variety of forms but like social democracy in western Europe, it was not ecologically and socially sustainable. It alienated the majority of citizens and their disaffection and protest eventually led to its downfall.

The legacy of Fordist industrialism in ECE has left severe environmental problems which are now well documented (Andrzejewski & Baranowski, 1993, Carter & Turnock, 1993, Havlicek, 1993). The former state collectivist economies failed to price environmental resources and services adequately and they adopted over-rigid production norms which were generally realized at the expense of the environment. Technologies were increasingly old and dirty and lax law enforcement, together with mismanagement and apathy, also contributed to pollution and waste. Successive attempts at economic reform resulted in growing debt and dependency while secrecy, and a lack of democracy, discouraged environmental protest. Independent green movements did however exist and they played a key role in the velvet revolutions of 1989/90.These highlighted the exhaustion of modern totalitarian and hierarchical forms of government and unleashed a nascent discourse of radical democracy which embraced green socialism. This recognised that these societies have a legacy of common ownership and collectivism which could assist their transition to sustainable development, and that they should try to "leapfrog" the West by restructuring their economies and societies in ways which avoided the resource depletion and waste associated with consumer societies (French, 1991). Unfortunately these hopes have not been realized.

In 1990 a conference of member states of the UN European Economic Commission, held in Bergen, adopted the principles of sustainable development for

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the whole European region. Green movements in ECE, such as the Polish Ecology Club, advocated such development in the 1980s and it is a condition of treaties of association between ECE states and the European Union. Proposals for "leapfrogging" take socialist and social democratic forms and those published on behalf of the Polish Ministry of Environmental Protection (Nowicki, 199B) clearly seek a form of regulated capitalism. They suggest that an environmentally benign restructuring is Poland's only route to a healthy economy, capable of competing in international makets and conserving the environment, and go on to explore how the industrial, agricultural, transport and energy sectors should be reorganised. They insist that while economic instruments can assist such change, it is also dependent on legal and institutional support, and on adequate levels of investment. In this and other respects, the report echoes much to be found in the EU's fifth environmental action plan.

The problems which ECE states are likely to encounter in attempting to move straight to sustainable development, or what some would label sustainable growth, are explored by Manser (1993a & b). He suggests that such change is dependent on the adoption of five minimum policies and that it faces eight key constraints (Figure 1). In their over optimistic adoption of market reforms the governments of ECE have generally given too little attention to these policies and constraints and have made the false assumption that if they establish a viable market economy then a cleaner environment will automatically follow. The main instruments of economic transition or restructuring have been privatisation, the removal of subsidies and state controls on prices, the freeing of international trade, currency convertibility, hard budgetry controls, foreign investment, and bilateral aid agreements. Shock treatment, such as that associated with the Balcerowicz plan in Poland, precipitated recession, unemployment, rising social inequalities, and growing crime and corruption. There was some immediate improvement in environmental quality due to plant closures but the collapse of the craft sector, the intensification of agriculture, and the rise of wasteful consumption, all rendered sustainable development more difficult to realize, and the environment soon ceased to be a priority as profits, jobs and wages, and debt repayment, became the prime concerns of firms, workers, and government. The necessary funds for environmental investment failed to arrive from internal or external sources and the public's limited and fragile support for "leapfrogging" waned. Democratic socialist parties did however do well in ECE elections in 1994 and such support may well revive.

Manser suggests that the development path of ECE will be increasingly determined by multinational companies, domestic investment, and western development banks. There is now little prospect of these countries avoiding individualism, materialism, and consumerism, and they are already the victims of social and environmental dumping (Andrews, 1993). The hopes of a pro-active approach to environmental protection have been replaced by a weak retro-active approach but it is not too late for changes in policy and direction. He advocates more selective and supportive approaches to privatisation, together with more regulated forms of restructuring and reform of banking systems. The European Bank for Reconstruction and Development should take a more proactive role and the EU should provide greater access to its markets and greatly increased amounts of aid. Enlargement of the EU is currently constrained by members' reluctance to agree a larger budget and their increased skepticism concerning the benefits of extending full membership to ECE states in a time of economic uncertainty. Reform of the CAP and new visions and agreements on European security would ease enlargement but some sections of capital and their

Ecological restructuring in eastern and central Europe

The five minimum policies needed to move to an economy based on the precautionary principle which does not destroy the earth's resources:

- setting raw material prices to cover the full costs of exploiting non-renewable resources;
- the adoption in practice as well as in theory of the polluter pays principle;
- the integration of macro and micro economic and environmental activities, using lifecycle analysis of products, a critical examination of energy use, and a rapid move to best available (clean/low waste) technology;
- appropriate environmental investments; and
- cleaning up the environmental abuses of the past.

The eight constrants on adopting and implementing these policies:

- the absence of an economic model of how to move from a state owned to a privately owned economy; the region has consequently become a live experiment;
- the legacy of communism - the social habits and economic structures of the last 40 years were more permanent than many had thought;
- the lack of appropriate infrastructure and resources - capital, management, skills, and professionals in a number of areas;
- heavy indebtedness;

- the politicians' lack of experience and consequent mismanagement of government;
- the shortage of foreign capital;
- the dearth of foreign aid;
- the deep recession brought on in the region by the stabliization policies of the International Monetary Fund and the more to international hard currency trading with Comecon.

The Squandered Dividend: The free market and the environment in Eastern Europe, R Manser, Earthscan, 1993, pages 10 & 150.

Figure 1

allies in governments, will continue to oppose extending west European social and environmental standards to eastern Europe. In this situation social democratic and green socialists, east and west, have much to gain from political and cultural linking and green socialists should seek first the establishment of environmentally responsible mixed economies and liberal democracies, and then a shared midway convergence towards diverse yet linked forms of green socialism.

A midway convergence for Europe.

Adam Swift (1993) provides a model of what such a convergence might entail in the medium and longer term. Nation states have comprehensive bills of rights and fair and representative government by all-party alliances which ensures free and fair markets for policies and votes. Much power is devolved to regional assemblies, but there is a central national body to overview and plan sustainable development guided by public referenda. Environmental protection and pollution control is co-ordinated regionally and nationally and states elect members of European and world assemblies which co-ordinate development and regulation from above. In addition to a world assembly elected by states, there is a global council which coordinates the work of

international secretariats already functioning under the UN umbrella. Other basic international provisions include a world taxation system and a world environmental and resource conservation commission.

Swift's model also embraces economic and social systems. There would be official bodies to auction annual resource depletion rights, secure agreement on annual changes in wages and salaries, monitor major annual price changes, and auction and allocate import certificates. Ownership of all enterprises over a minimum size would be equally distributed between the state, the workforce, mangement and related staff, and outside shareholders, to ensure co-operation and efficiency, and there would be corresponding input-output accounting systems for the four ownership groups. Social cohesion and a common purpose would be further aided by a guarantee of useful work for all, a floor of minimum income, and adequate social welfare. Poverty would be avoided through redistributive fiscal policies and land reform, economic planning and resource allocation, a measure of public control over means of production and distribution, and educational policies to promote equality of opportunity. Swift's proposals echo those of other green socialists and would allow the peoples of Europe to embark on a virtuous spiral of reconstruction and renewal. He assesses the strengths and weaknesses which east and west bring to such a convergence and suggests that once it is established, citizenship education would provide a strong binding cement. It would make everyone aware of their rights and obligations from an early age and would educate them in society's rules, laws, ways of change, and the essence of its natural and organised interdependence. It is to geography's role in such education that we now turn.

Towards a critical geographical education

Unwin (1992) has explored how the study and teaching of geography is shaped by the three knowledge constitutive interests identified by Habermas. He traces the history of the subject in terms of these interests, devoting separate chapters of his book to the hermeneutic (humanistic or interpretive) and critical (radical) geographies which developed in the 1970s and 1980s to challenge the established orthodoxy of technical (empirical and positivist) approaches. Like others (Huckle, 1983, Johnston, 1986, Bartlett, 1989), he suggests that geography and geographical education dominated by technical interests continues to assist the management and control of society and the environment in the interests of a minority, and that such activity has found additional support and legitimation in recent years as a result of the conservative restructuring of societies and education which has taken place in many parts of the world.

After recognising that humanistic and radical geography could be linked with parallel philosophies in education to provide a more appealing and relevant geographical education for the majority of pupils and students, much of my work has centred on developing a critical environmental education curriculum for older school pupils. The What We Consume module of WWF-UK's Global Environmental Education Programme (Huckle, 1988) seeks to exemplify what Unwin terms critical geographical education by incorporating the kinds of political economy perspectives on environment and development issues which are contained in the first part of this article. These are combined with critical pedagogy in a hundred classroom activities, spread over ten units, which enable teachers and pupils to use key questions to explore key ideas and so develop key concepts. The curriculum framework which

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incorporates these key questions, ideas, and concepts draws on notions of poltical literacy and citizenship education developed by the Programme for Political Education (Crick & Porter, 1978). It is set out in The Teachers Handbook which also includes an introduction to background theory and a set of short readings to introduce teachers to critical environmental education. Unit 10 of What We Consume contains activities on the environment and development in Poland while Unit 9 includes activities on the environmental policies of the European Union.

In the ten years that I have been working on What We Consume philosophical and theoretical perspectives in geography and education have evolved at a quickening pace. Structuration theory, realism, and post-modern human geographers have risen to challenge orthodox Marxist approaches (Cloke, Philo & Sadler, 1991) yet the latter have also evolved and continue to offer new insights into society-nature relations. What We Consume was strongly guided by world systems theory but more recent units have incorporated elements of regulation theory and of debates about the nature and political significance of post-modernity. Peet's reworking of historical materialism for the contemporary world (Peet, 1991), Harvey's (1989) analysis of the post-modern condition, Pepper's (1993) defence of green socialism against other forms of green political thought, and the ecological Marxism being developed through the journal Captalism, Socialism and Nature, are just some examples of what remains a rich reservoir of ideas for curriculum development.

While retaining its Marxist roots, critical theory in geography and education has developed to embrace a range of post-Marxist positions. The most influential in geographical and environmental education is that underpinned by the theories of legitimation crisis, knowledge constitutive interests, and communicative action developed by Jurgen Habermas. These suggest that the crisis of modernity, which currently affects both eastern and western Europe, is essentially due to the subversion and distortion of rationality by the rise of instrumental reason and an associated technocracy. These separate knowledge from values, means from ends, and ethics from politics, with the result that bureaucratic states are unable to respond effectively to such steering crises as those induced by worsening environmental problems. The resulting legitimation crises can only be solved by adopting more democratic and discursive forms of communication and decision making. These would allow more comprehensive forms of rationality to emerge, allowing the expression of universal human values, and so providing the key to restoring the promise of the Enlightenment and reclaiming the modern project.

The critical theories of Jurgen Habermas have been applied to environmentalism and education, notably in Australia (Young, 1989, Eckersley, 1992). The Deakin-- Griffith Environmental Education Project demonstrates how they can be used to advance critical curriculum theorizing (Fien, 1993a), research (Robottom & Hart, 1993), and education for sustainability (Fien, 1993b), and my own work with WWF-UK's teacher education programme Reaching Out (Huckle, 1994) develops similar perspectives. Giroux (1992) maintains that Habermas is wrong to dismiss all aspects of post-modernism as anti-modern and neo-conservative, and that his notion of modernity is too complicitous with a notion of reason that is used to legitimate the superiority of a culture that is primarily white, male, Eurocentric and technocentric. His arguments suggest that critical environmental education needs to rethink how aspects of post-modernism, ecologism, feminism and other discourses can be used to deepen the democratic possibilities within the modern project and to this end, it needs to draw on a wider range of critical theory. This argument is echoed in

Orr's call for education for sustainability to embrace a constructive post-modernism (Orr, 1992) and in the work of the Centre for Global Education at York (Greig, Pike & Selby, 1987). Two bodies of relevant theory will now be reviewed before considering geography's role in the kind of citizenship education necessary to aid the transition to a converging green socialist Europe.

Late modernity, self identity and risk society

Giddens and Beck's work on the nature and politics of modernity and its relation to the self have followed parallel directions. Giddens (1991) suggests that late modernity (or what others would label post-modernity) displays four institutional dimensions which are propelled by three sources of change. The world capitalist economy, the nation state system, the world military order, and the international division of labour, are now truly global in scope and reach, and their dynamism results from time-space distantiation, disembedding mechanisms, and reflexivity. The development of generalised systems of time and space allows modern organisations to run their global affairs in ways which connect the local and the distant, and the present and the future, in ever more complex ways. At the same time disembedding mechanisms or abstract systems, in the form of symbolic tokens such as money, and expert systems such as environmental impact assessment, allow the separation of social and environmental relations from their immediate contexts. The combined result of time-space distantiation and disembedding is to promote globalising tendencies, quicken social change, and disorientate individuals. Society and self become more reflective as tradition is swept away and both social practices and self identity have to be continually examined and reformed in the light of rapidly accumulating knowledge.

The nature and pace of change in late modernity brings threats of personal meaningless and insecurity in changing environments of trust and risk. Trust is anchored in personal relationships and social ties, in abstract systems which stabilize relations across time and space, and in critical theories, ideologies and utopias which connect past, present and future. Risk results from the dangers and uncertainties emanating from the reflexivity of modernity and from its four institutional dimensions. The risks of a collapsing economic growth, totalitarianism, war, and ecological decay have prompted the rise of the labour, human rights, peace and environmental movements and these provide many of the contours of a post-modern order similar to that envisaged by green socialists. While late modernity compels people to be reflective about their lives and sustain a revisable narrative of self-identity, many remain unaware that such cultural and lifestyle choices are on offer. A life politics concerned with self actualization, life decisions and self identity, now exists alongside an older emancipatory politics concerned with life chances. It seeks the creation of morally justifiable forms of life in the context of global interdependence and raises ethical questions which undermine the hold of instrumental reason.

Giddens (1993) also suggests that the rise of reflexivity helps us to understand the rise of post-Fordist modes of regulation. Reflective people demand more flexibility and involvement and socialism should adapt to new times by developing a conserving radicalism which unites emancipatory and life politics (Blackwell & Seabrook, 1993). Green socialism should offer people ontological security by stressing repair, conservation, and care but should avoid the 'naturalistic fallacy' to which much green political thought is prone. At a time when neo-liberals on the right offer a market individualism which contradicts and subverts the traditional values they also

expound, Giddens echoes Bauman in suggesting that the left have much to gain from taking stock of late modernity and developing an appropriate counter culture that appeals to new insecurities.

Beck (1992) echoes Giddens by suggesting that in late modernity societies based on scarcity are giving way to reflexive societies based on risk (Figure 2). His thesis is that industrial society now produces its own endangerment and a questioning of itself through the multiplication and economic exploitation of hazards. It 'nourishes' itself from the risks it produces and its knowledge of these, and in so doing it creates new social risk positions and political potentials. In risk societies knowledge gains a new political significance since the existence, distribution and significance of such risks as low level nuclear radiation are mediated through arguments in which scientific evidence plays a key role. Scientific or instrumental rationality offers the possibility of objectively determining risks with expert authority but definitions and assessments of risk inevitable incorporate values and raise issues about how we want to live. Risk determination resurrects ethics, philosophy, culture and politics within late modern societies with new social and political movements recognising this and urging new notions of rationality and progress which are reflected in their proposals for an ecological restructuring of those societies.

A critical geographical education drawing on Gidden's and Beck's critical theories of late modernity would assist students in recognizing the sources of their ontological insecurity and understanding their risk positions. It would also draw on everyday experiences to explain how the late modern world works and how the insecurities and risks it engenders can be concealed, interpreted, managed, and exploited in many different ways. It would encourage critical reflection and action on the threats and opportunities of new times; would help students to recognize the attractions and dangers of retreating into new forms of fundamentalism; and would assess and seek to equalise access to a range of cultural and political resources they might use in constructing their own identities and life plans. In risk societies where consciousness determines being, such an education becomes increasingly vital. It would unite natural and social scientific realism, and human and physical geography, in examining the nature, definition and politics of risks, and would be an integral part of attempts by communities, regions, nation states, and supranational alliances to realize sustainable development.

Critical geographical education for citizenship in a converging green socialist Europe

Having reviewed the challenges of defending and advancing social democracy as a route to a green socialist convergence in Europe, and outlined the present and possible future nature of a critical geographical education, it remains to suggest how such education might respond to these challenges by contributing to a reformulated citizenship education.

Firstly it should be acknowledged that globalization threatens the competence, form and autonomy of the nation state as it is challenged by supra-national integration from above and demands for devolution and grassroots democracy from below (McGrew, 1992). Much power remains invested in nation states but globalization forces us to revise our understanding of the modern political community and citizenship. At the same time the emergence of new social movements and forms of politics, seeking to extend citizens' rights and responsibilities to the economic and

Figure 2

Scarcity and Risk Societies Compared

Scarcity society	Risk society
Problems and conflicts related to the distribution of scarcity.	Problems and conflicts that arise from the production, definition and distribution of techno-scientifically produced risks.
Governed by a positive logic of wealth acquisition and distribution. How to legitimate an unequal distribution of wealth?	Governed by a negative logic of risk distribution, avoidance, denial or reinterpretation. How can risks be prevented, minimized, . . distributed away?
Class conflict over wealth distribution.	Social struggle over the risk definitions. The scale, degree and urgency of risk.
Questions about the development and use of technologies to manage and control nature, society, personality.	Questions about the economic and political 'management' of the risks of actually or potentially utilized technologies.
Plenty for most legitimates modernity.	Heightened awarenss of risks prompts a growing critique of modernity.
Wealth/poverty is real, felt, visible and place specific.	Risks often invisible and not tied to place. Unknown and unintended risks come to be a dominant force in history.
Social class positions in which being determines consciousness.	Social risk positions which are knowledge dependent. Consciousness determines being.
Social polarization along class lines.	Only partial polarization. Sooner or later risks are seen as universal threats.
Ideal of equality.	Ideal of safety or security.
Utopia is larger shares for everyone.	Utopia is when everyone is spared from poisoning.

Based on Beck, 1992

Figure 2

cultural spheres and to the diverse sites and practices which constitute society, locality and self identity, provides further grounds for revision. Consequently citizenship education should now be based on a multi-level, multi-dimensional model of citizenship such as that outlined by James Lynch (1992). This allows pupils to explore the inter-dependent rights and responsibilities which are necessary at different levels, and in different domains of their lives, in order to make sustainable development a reality. It thus provides a framework for critically examining the kinds of proposals outlined in Swift's midway convergence for Europe and in such documents as Towards 2000, Caring for the Earth, or Agenda 21, and comparing them with current realities.

Such citizenship education is unlikely to appeal to students unless it is anchored in locality and local issues. Locality is constituted and reconstituted by interdependent developments in the economic, political, civil and cultural spheres, such as those reviewed in the early part of this paper, and it provides the immediate context for people's attempts to extend democracy and gain greater control over their lives.

Smith (1989) suggests that social democratic citizenship theory helps explain the structuring of society and locality and that by also providing some normative principles to guide their democratic restructuring, it could enable geography's radicalism to survive at a time when its relevance is challenged by the politics of post-Fordist economics and post-modern culture. Her argument supports the kinds of local or municipal socialism which have developed in some parts of western Europe, over the past decade. These attempt to challenge the new Right's concepts of economic efficiency, individual liberty, and citizenship by extending people's participation in local economic initiatives, service provision, planning and decision making, and cultural affairs. Unit 10 of What We Consume encourages teachers and pupils to explore local socialism in Sheffield in the mid 1980s and suggests that its attention to democracy and socially useful production made it a suitable vehicle for extending citizenship and establishing more sustainable forms of development. The local Agenda 21 process offers new opportunities to consolidate and extend local green socialist initiatives (Agyeman & Evans, 1994) and there are other curriculum materials which allow geography teachers to educate for sustainability and citizenship while getting more involved with the local community and its concerns (Poulton & Symons, 1993, Birmingham DEC, 1992).

Geographical education for citizenship and sustainability should not ignore post-modern popular and youth culture. In analysing the implications of post-modernism for citizenship and citizenship education Gilbert (1992) suggests that post-modern culture can lead in both positive and negative directions. On the negative side, it makes the contract between the individual and society, on which citizenship is based, harder to perceive, and renders much contemporary political culture anarchic, disorganised, rhetorical, stylised and ironic. Advertising and the media constitute consumer objects as systems of signs in which people find meaning and an illusory sense of identity and self-determination in the act of consumption, yet only a minority is able to use post-modern culture constructively to aid the reflexive project of self identity which Giddens describes.

On the positive side, post-modern culture is democratic, deconstructs hierarchical institutional forms, and is critical of convention due to its self-parodic and self-ironising style. It questions the modern grand narrative of citizenship in favour of a more complex story such as that outlined above, and provides people with new cultural products which can be turned in radical directions. Environmental and development non-governmental organisations have begun to use post-modern culture for educational purposes and there is much scope for geography teachers and their pupils to explore representations of nature, the environment, and environmental issues in popular culture as academic geographers have begun to do (Burgess, 1990).

Gilbert's call for greater attention to the political economy of culture within citizenship education, is echoed by Giroux in his appeal to critical educators to form alliances with a wide range of other cultural workers and persuade them of the primacy of pedagogy and politics. Such workers will include planners, those working in local media, environmental and community group activists, and trade unionists, and in order to lead local communities towards sustainable development, they will need to be skilled in critically deconstructing cultural representations, creating political imagination, and extending awareness of green socialist and other possibilities. Their pedagogy will be a form of political, moral and social production which uses a range of media to help people understand how knowledge, identities, societies and environments are produced and how they can be changed. It will

facilitate the forms of self and social empowerment which develop from reflection and action on the kinds of critical theory outlined in this article, and by incorporating elements of modernism, post-modernism, and ecologism, such pedagogy should be able to advance the Agenda 21 process in ways which extend radical democracy.

The future of critical geographical education in Europe

Having arrived at the nature of a geographical education that can assist the transition to more sustainable forms of development throughout Europe, it remains to remind readers that such education faces formidable opposition. The economic and social restructuring of the 1980s has brought about a conservative revolution in education in many parts of western Europe and progress towards more democratic forms of schooling (Jensen & Walker,1989) has slowed or gone into reverse. Education systems in ECE may adopt reforms which repeat the mistakes of the west (Brown, 1992), but there are now more contacts between geographical and environmental educators from different parts of Europe and more opportunities for sharing critical perspectives (Kelley-Laine & Posch, 1991, Sterling & Cooper, 1992). My own limited experience of consultancy in Poland, funded by the UK Government's Environmental Know How Fund, suggests that eastern Europe may be suffering from a surfeit of advice as far as environmental education is concerned and that much of this reflects a limited awareness of the real problems and possibilities of social and environmental reconstruction. Such 'aid' brings 'expertise' without sufficient additional money and resources to effect real change in schools and may be offered and received by inappropriate people. Given the real problems faced by most teachers and teacher educators in ECE, it will not be surprising if it has little long term effect. Clearly some elements of approach and pedagogy can be quickly demonstrated, adapted, and adopted if they seem appropriate, but real dialogue and action on appropriate forms of education for sustainabiity requires more time, resources, and different kinds of expertise than most consultancies can provide.

This article has suggested that struggles to establish critical forms of geographical and environmental education which can aid the transition to a green socialist Europe, are part of wider struggles for democratic and sustainable futures. The importance of the European Union is that it prefigures a democratic world federation or an era in which global interdependence will be democratically managed (Burke, 1989, Denitch, 1990, Palmer, 1993). Such sharing of sovereignty and power is increasingly necesary at a time when Europe, and the rest of the world, is faced with renewed instability and violence resulting from such causes as free trade, the impact of new technologies on employment, environmental degradation, and the rise of nationalisms and facism. Geographical education can assist in the transition to a safer and cleaner Europe and in so doing, it can play its part in ensuring that the creativity, ideals and courage of the youth of the world are mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all (Rio Declaration, Principle 21).

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2.0 THE GLOBAL DIMENSION IN GEOGRAPHY EDUCATION

THE NATIONAL SCHOOL TRIALS
OF THE GEOGRAPHIC INQUIRY
INTO GLOBAL ISSUES MODULES

A. David Hill, Robert W. Richburg, and Phil Klein

Geographic Inquiry into Global Issues (GIGI) is a secondary instructional materials development project of the Center for Geography Education in the Department of Geography at the University of Colorado at Boulder. Supported by a grant from the National Science Foundation (NSF), this is currently the largest publicly funded geography materials development project in the United States.

The project aims to help meet the goals of teaching responsible citizenship, geographic knowledge, and critical and reflective thinking to secondary (grades 7-12) students. Viewing its task as a process of translating the discipline of geography for educational purposes (Dunn 1992; 1993), the project seeks to create challenging, useful, and relevant issues-oriented materials in order to motivate students to learn geographic content, skills, and perspectives. GIGI is one of two large secondary materials development projects seeking to address the developing reform movement in the United States for standards- based education in geography (Hill 1994a; 1994b). Any project such as GIGI that purports to address national needs requires a national assessment, which is the subject of this paper.

GIGI is creating twenty issues-oriented, data-based modules--two modules for each of ten world regions. The modular format offers significant flexibility in use. There is no necessary sequence of modules; each one is free-standing and pre-supposes no specific student skills or needs. This allows teachers to use them in any desired order, to use a few modules for a special interest cluster, or even to use only a single module. Based on Slater's (1982; 1993) question-driven inquiry activity planning model, a leading question frames the issue of each GIGI module, and student inquiry proceeds through a sequence of lessons.

The GIGI project began in September 1990, and in 1991-92, the staff conducted a first round of trials with its prototype modules in secondary classrooms in Colorado. Those trials led to a revised set of provisional modules that were subjected to nationwide trials in early 1993. A second revision of the materials, based on findings from the national trials, began in May of 1993 in order to produce final manuscripts for publication in 1994 by Encyclopaedia Britannica Educational Corporation of Chicago, Illinois. Earlier papers (Dunn 1992; 1993; Hill et al. 1992) discussed the project's rationale, development process, and evaluation plan. Based on the national trials and additional interviews and classroom observations, Klein (1993) provided a comprehensive quantitative and qualitative study of the effectiveness of three of the project's environmental issues modules. This paper, which draws upon a report by Richburg (1993) and the item analysis done by Phil Klein, discusses GIGI's national school trials.
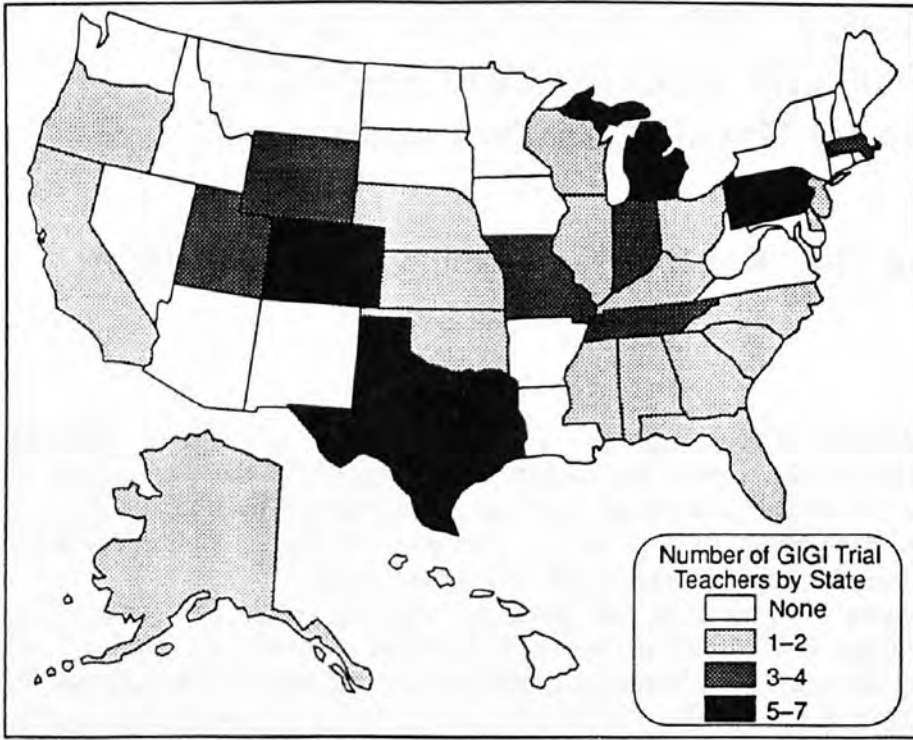
Figure 1: Location and Number of Trials, By State
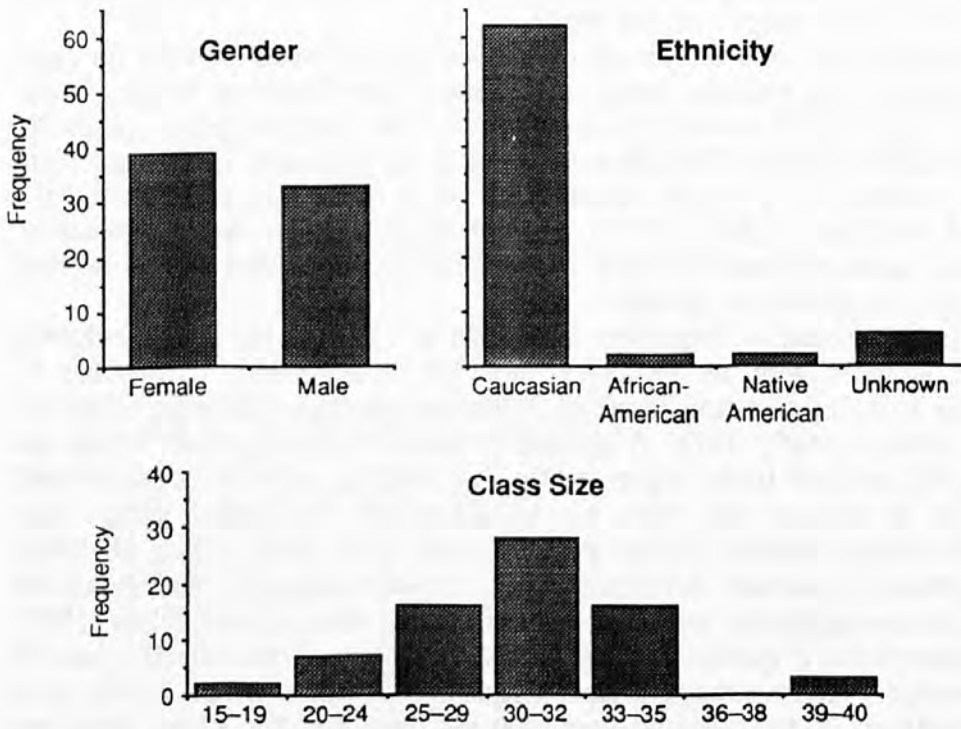
Figure 2: Ethnicity, Gender, and Class Size of Trial Teachers

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Background to the National School Trials

In the Spring of 1993, twelve modules of the GIGI series were field-tested in seventy-two classrooms, situated in twenty-nine states around the United States (Figure 1). Each of these two- to three-week modules, containing a teacher's guide and student book, was evaluated by six trial teachers, three of whom taught at the middle school or junior high level and three of whom taught at the high school level. Over 3,000 graduates of state geography alliance summer institutes were invited to apply to be trial teachers, and about 350 applications were received. All seventy-two trial teachers (Figure 2) identified another teacher in their building with similar responsibilities and students to provide control groups for testing comparisons. The control groups were pre- and post-tested at the same time as the classes using the GIGI modules, but in the intervening weeks utilized their usual geography or other social studies curricula. One-third of the trial and control classes were situated in rural/small town communities and the remainder were in metropolitan (city/suburb) areas.

The Goals of the National School Trials

The National School Trials were structured to answer four questions:
1. Did students achieve the content objectives of these modules?
2. Were individual modules better suited for middle school/junior high students as compared to senior high level students?
3. Were gender differences significant in the achievement scores associated with these modules?
4. Was community setting significant in the achievement scores associated with these modules?

Although the primary goals were summative involving the assessment of the effectiveness of each module, there was an ongoing interest in collecting teacher and student perceptions that would lead to the revision of the materials prior to publication. Most of this formative evaluation process was focused on the Teacher Questionnaire described below. In addition, qualitative data were gleaned from Klein's visits to select trial sites (Klein 1993). These data, although not systematically reported here, provided important insights, some of which are given in this report.

Student Asessment Booklets and Teacher Questionnaires

The instruments utilized to quantitatively assess the student learning were developed through an eight-month process. Initially, an item-writing conference was held in Boulder, Colorado, in June, 1992. Authors of original drafts of prototype modules, teachers for the classroom trials of prototype modules, and the GIGI project staff (A.D. Hill assisted by J.M. Dunn and P.A. Klein) generated assessment items in rough form. These were reworked and added to by the evaluation consultant (R.W. Richburg) in the Fall of 1992 and in several cases were field-tested before the 1993 National School Trials.

Three types of quantitative data were collected: (1) achievement on module-specific content, (2) achievement on "generic" content, and (3) attitudinal data involving student interest in geography and in specific GIGI topics. All test items were included in assessment booklets for each module. Assessment booklets consisted

of seven module- specific, concept-oriented, multiple-choice items and one world map location item. Additional items were included on three modules being tested in a separate study (Klein 1993). In addition to the eight module-specific items, there were four "generic" items utilized across all twelve assessment instruments. These generic items were designed to measure students' understanding of general geographic perspectives and the geographic inquiry process. Finally, each instrument contained thirteen interest items with which students could register their general level of interest in geography and, more specifically, in each module issue. Because of lack of space, this paper will not report on the interest items.

To supplement the data on student achievement and interest, the trial teachers provided information on the quality of each module by completing a Teacher Questionnaire. This ten-item document asked each teacher to assess the overall effectiveness of the module that they tested and to describe the instructional strengths they noted in it and the improvements they felt it needed. In some cases the trial teachers included student comments in their assessments.

Student Achievement on Module-Specific Content

Assessment of knowledge gained from studying each module was based on module-specific, concept-oriented, multiple-choice items and one world map location item. There was convincing evidence of student learning as a result of studying the modules. Each module-specific test demonstrated a pre- to post-gain in student achievement for the trial classes on most of the test items. At the same time the control classes showed no significant gains on these same items. Figure 3 summarizes these gain scores for the eight module-specific test items related to each of the twelve modules. Student N ranged from 129 on Waste Management to 190 on Natural Hazards, with a mean of 162 for all modules. All modules, except Building New Nation-States, showed gains significant at greater than .001 on a 2-sample Kolmogorov-Smirnov test of frequency distributions. In every case the average score on the items for the trial classes far exceeded the control class overall. Because each of the module-specific items was related to an objective that is a central focus of the module, there can be little doubt that the modules were the cause of these gains.

Although Figure 3 provides clear evidence that substantial learning occurred in trial classes, it also shows that this learning was not even across all modules. After studying the Environmental Degradation module, for example, the scores of trial classes averaged over 31 percent higher than their pre-test scores. By comparison, the trial classes studying Building New Nation-States gained only 6.5 percent as a result of studying their module. There is a temptation to conclude that the Environmental Degradation module is a more effective set of instructional materials. Yet these data alone may not be sufficient cause to draw this conclusion. Although trial teachers were asked to follow the materials as written, there can be no guarantee that they did so, because no one monitored all the trials. Any number of variations may have occurred. For example, it is possible that individual teachers may have supplemented the trial materials with additional ideas and exercises in the case of the one module and they may have stayed with the prescribed trial materials in the case of the other. Another cause of differential gain scores might be the module tests themselves. One teacher, for example, indicated that she felt the test for the module she was testing really didn't capture the essence of the module. In such a case the gain scores might not be as high, even if the module material was effective instructionally. In any case, teacher critiques strongly suggest that some modules were weaker than others. Indeed,

Figure 3: Trial Gains in Percentage Correct from Pre- to Post-Test on 8 Module-Specific Items.
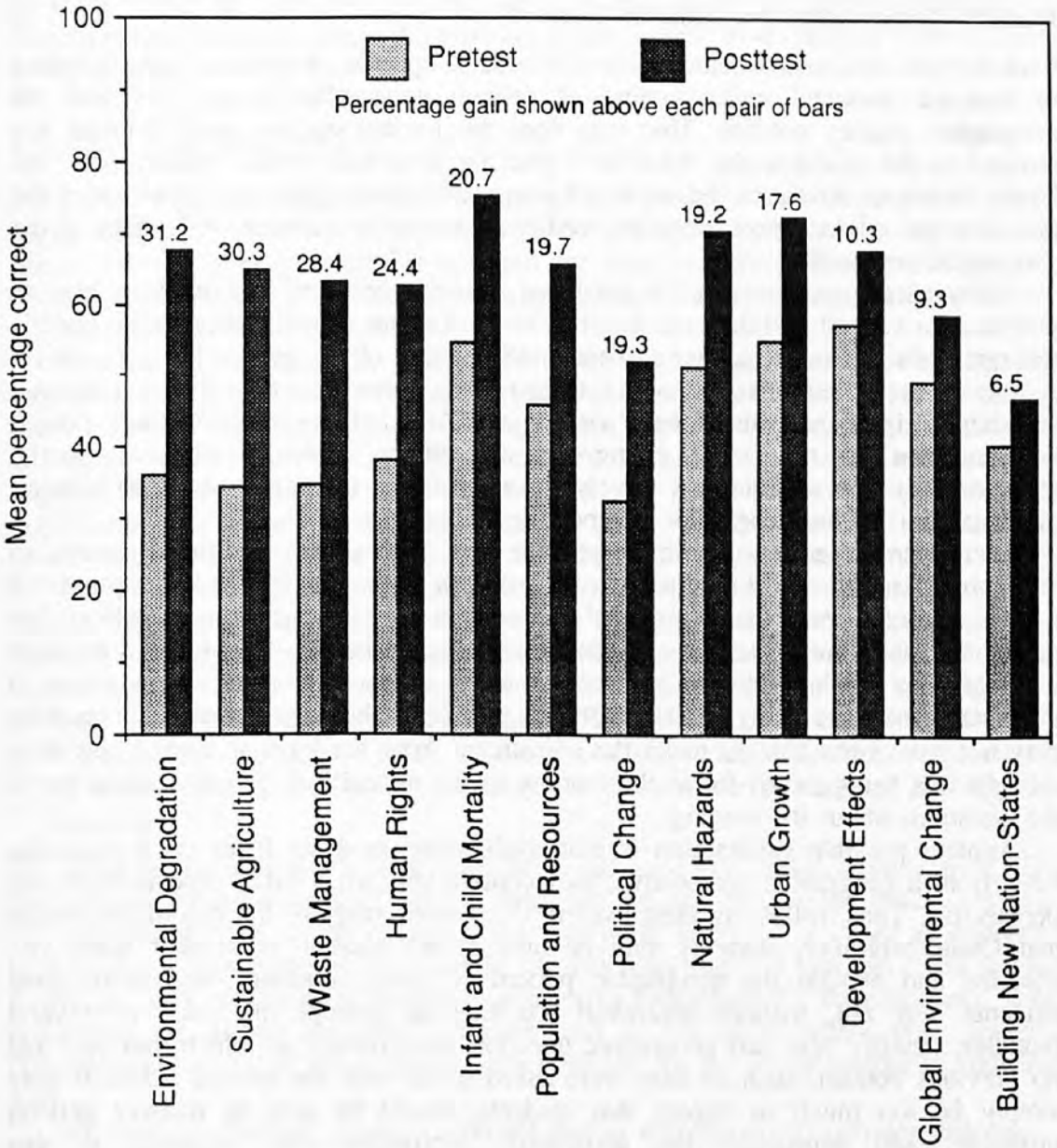
Hill, Richburg, and Klein
Figure 3
Gains from Pretest to Posttest

Building New Nation-States was one of the weakest modules, which is why it was extensively revised following the trials.

Student Achievement on Generic Content

Each module assessment included four non-module-specific, or generic, items designed to measure students' understanding of general geographic perspectives and the geographic inquiry process. This was done by having students read material not covered in the modules--the NAWAPA plan for large-scale water transfer from the North American Arctic to the lower 48 states--and asking them questions about the plan that one might expect would be readily answered by a person well-versed in the geographic perspective.

Although the module-specific test items showed considerable gains from pre- to post-test for virtually all the modules, there were few measurable gains in the generic test questions utilized to assess student understanding of the geographic perspective. Across all twelve modules, involving 48 test items, there were only five that showed statistically significant gains for the trial classes. Although the control classes showed no significant pre- to post-test changes on these items, it would still seem that the study of only one module was largely unsuccessful in moving students to a better understanding of the geographic perspective.

There were at least two probable reasons why these generic test items showed so few gains. First, the short reading that was used as a stimulus for the items contained a great deal of detail that compelled the student to be focused on specifics. The questions that followed, on the other hand, were quite abstract--they focused on what a geographer might additionally want to know about this situation in order to understand the issue being described and its impact on the environment. The students may not have been able to make the adjustment from the kind of mental task they thought was being called for in the reading to the mental task actually called for in the questions about the reading.

Another possible explanation is that while these modules focus on a particular issue from a geographic perspective, they contain very little direct exposition of that perspective. Thus, following their two- to three-week study of the module on Infant and Child Mortality, students may be able to do what a geographer does, i.e., describe and explain the geographic pattern of infant mortality. But those same students may not, without additional coaching or perhaps the study of several modules, identify "the best geographic question" in a context in which they had had no previous contact, such as they were asked to do with the generic items. It may simply be too much to expect that students should be able to transfer general principles and approaches--the geographic perspective--after exposure to this perspective for such a short period of time. Use of several modules over the course of several months would provide students with greater insight into the nature of geographic inquiry.

Student Interest Scales

Space does not permit an examination of the results from the student interest scales, but suffice it to say that assessments showed few significant changes for the twelve modules. Generally, students were little more interested in geography or the topic of focus in each module when they completed these modules than they were when they

began. The lack of quantitative support for student interest gains seems contrary to numerous statements by teachers indicating considerable student interest. Interest in GIGI topics may not have been improved for two reasons: (1) Modules of only two to three weeks may not be long enough to effect significant shifts in attitude; (2) Teachers may not have taught the modules in the inquiry mode as they were intended to be taught.

Learning from three Modules

This section presents data summaries for selected modules: the one that showed the highest average achievement gain (Environmental Degradation), one having a slightly above average gain (Human Rights), and the one having the lowest average gain (Building New Nation-States). Some representative teacher comments about the modules' effectiveness are included.

As Figure 1 indicates, the gain scores of the trial classes on the module specific test items was greater for Environmental Degradation than any of the other modules. Each individual item among the nine-item, module-specific test showed a statistically significant gain at the .01 level. Most certainly the gain for the nine-item test taken together is significant. In contrast, the control classes showed no statistically significant gain for any of the individual test items and the nine-item average gain is only half of a percentage point, which is far from a significant gain.

The trial teacher's comments generally concur with these test conclusions. Three of those reporting felt that this module overall was a "very worthwhile" learning experience for their students. Two individuals said that it was a "generally worthwhile" experience for their students. Commenting on what his students learned, one 9th Grade trial teacher from Nebraska said:

I believe that the student really gained a new appreciation for the complexity of environmental issues and grasped the importance of making the right decisions.

The Human Rights module may have been the most successful module tried. The trial classes gained almost 25 percent from pre- to post-test on the module-specific test items, while the control classes showed virtually no gains. At least as important in describing the success of this module, all five reporting trial teachers rated Human Rights as "very worthwhile" overall, as a learning experience for their students. Their comments are almost uniformly positive and in the cases where their students comments are included, these too are very positive. An 8th Grade teacher in Alabama said:

The module concisely covers a subject that is not investigated by the current textbooks. The activities involve the students in the planning and learning process. They enjoyed the hands-on experiences and were able to feel good about their accomplishments.

Building New Nation-States showed the smallest pre- to post-test gain score of any of the modules. These trial classes realized a 6.4 percent gain over the period of the trial compared to 1 percent for the control classes. Only three of the eight items that comprised the module-specific assessment showed statistically significant gains from pre- to post-test.

Yet, two of the five trial teachers rated this module as a "very worthwhile" learning experience for their students. Two rated it as a "generally worthwhile"

learning experience and one rated it as a "generally not worthwhile" experience. Teacher comments indicate that "vocabulary difficulty was paramount" in the module and that the module required more background and geographic preparation than some of the teachers possessed. More than one felt inadequate to the task. Still, there was appreciation for what the module brought to students. As one 9th grade world geography teacher from Colorado said:

> *The students really enjoyed the 'hands-on' worksheets. The module made the students think and critically analyze the situation before responding.*

Grade-Level Appropriateness

Because this project is seeking to produce materials suitable to a wide range of grade-levels, it was important to know if the modules were more positively received or resulted in greater student achievement at one grade level over another. It might be supposed, for example, that some modules would have better results at the high school level (grades 9-12) while others would presumably have a more positive reception at the middle school/junior high level (grades 7-8).

To answer this question, two sources of data were analyzed. First, the module-specific assessment item results were sorted so that the high school trial students' achievement could be compared to that of the middle school/junior high school students. Second, the Teacher Questionnaire, completed by the trial teachers, was stud'~d for comments about appropriateness for these grade levels.

With regard to the achievement data, some results are clear while others are not. The high school students out-gained and out-achieved their counterparts for four modules. On the other hand, the younger students out-achieved and out-gained their older counterparts on four other modules. The remaining four modules showed no clear pattern in relative achievement.

The Teacher Questionnaire revealed some concerns about modules that were too difficult or abstract for younger students. It is possible that these comments may also be indicating a concern about poor or weak instructional materials that would not be particularly well-suited for either age group. At any rate, several modules were identified by trial teachers as being less appropriate for younger students. No teacher indicated that any module was too simple or too easy for high school students. This part of the assessment enabled the staff to revise the modules to include directions to simplify or eliminate certain activities thought to be too difficult for younger students.

Gender and Community Setting Differences in Achievement

Although gender differences in achievement were not anticipated, the results for the module-specific assessments were nonetheless sorted by gender for each module. The results were interesting but certainly without any pattern that would encourage speculation as to cause. Nine of the modules showed no meaningful differences. On two modules, the male students out-gained their female counterparts. The female students showed larger gains than the males on one module. These data suggest that these inquiry materials are equally successful for both genders.

The type of community in which the classroom trials were located was examined for differences, but the results were as indefinite as with gender. The students did seem to perform differently according to their community size and type, but one

cannot be very confident of these results. The classes in rural/small town settings out-gained and out-achieved their metropolitan counterparts on six modules while the latter out-achieved the former on four modules. Two modules showed no perceptible patterns.

Teachers' Opinions

The overall reaction to the modules from teachers was positive. Analysis of Teacher Questionnaires afforded insights about the aspects of the modules that teachers liked and disliked and why students might have performed as they did on the assessments. Teachers were generally positive about the value of the modules in providing a worthwhile learning experience for their students. Only four of the seventy-two trial teachers registered a "not worthwhile" assessment of the module they had taught. Typically, teachers liked the "hands-on" nature of the materials, the inquiry/problem-solving type of learning situations and the attendant focus on higher order thinking. They were also positive about the fact that the modules focused on topics and issues not usually dealt with in the geography curricula they were accustomed to. Some consistent teacher concerns were recorded about the need to reduce the level of vocabulary and abstractness of concepts when these modules are taught to younger (grades 7-8) students.

Teachers' comments were extensively used by the staff in revising the materials for public tion, and these revisions addressed virtually all of the concerns of teachers.

Summary and Conclusions

GIGI's national school trials provided several important insights about its materials. Students exhibited a substantial amount of learning - an average of over 20 percent for the twelve modules - related to the key content objectives of these materials. Some modules were more effective with younger students, some with older students. This knowledge is being used by the project staff to address grade-level effectiveness, primarily through adjustments in reading level and conceptual complexity, as they revise the modules. Since the trials showed that the gender and community setting of students were not significant variables in achievement with the modules, the project may be confident that it has materials appropriate for a national audience. Finally, teachers supported the intent of GIGI. They indicated that they appreciated the quality and nature of the materials. They particularly liked the inclusion of "hands-on" activities, the inquiry-orientation and data-based approach, and the selection of issues and topics. They found that these qualities, although not typical of what is taught in geography, helped motivate students.

Although the GIGI modules are fulfilling important elements of the project's goals, rationale, and design, the project staff is acutely aware that good materials alone cannot produce sustained, high-quality learning. Without a good inquiry teacher and a family, school, and community that supports and encourages learning, a student's achievement will be severely impeded. These important caveats do not, however, diminish the importance of materials. Indeed, curriculum may be the central issue of educational reform in the United States, and GIGI's materials are at the leading edge of addressing this issue in geography. National trials of materials are an essential part of the reform process.

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THE US-RUSSIA GEOGRAPHY EDUCATION DEVELOPMENT PROJECT: A JOINT CURRICULUM MATERIALS EXCHANGE

Joseph P. Stoltman

Abstract

International comparisons of geography textbooks and syllabuses have been carried out by scholars, academic societies, and intellectual organizations. Collaboration on curriculum development is a recent aspect of geographic education. This paper reports on the collaborative curriculum materials development project between the U.S. and Russia. The project is designing classroom materials in both countries, written by academic geographers and classroom teachers. The materials from each country are being translated for use by teachers in the other country.

Introduction

International exchanges between scholars from two or more countries to discuss curriculum issues, textbooks, and especially the accuracy with which countries are presented to pre-university students have been of continuing interest since the mid-1940s. One of the first examples of textbook research was completed by the Prepatory Commission of Unesco when the content of school textbooks between the two world wars was examined in a document entitled Looking at the World Through Textbooks (Unesco, 1946). The general acceptance of the first publication led to a second, companion document entitled A Handbook for the Improvement of Textbooks and Teaching Materials as Aids to International Understanding (Unesco, 1949).

Geography and history were singled out as special topics for international textbook and syllabus review in the early 1950s. Unesco commissioned a world-wide survey of syllabuses and the results were published in a report entitled History, Geography, and Social Studies: A Summary of School Programmes in Fifty-three Countries (Unesco, 1952). The attention to geography textbooks and their accurate, objective presentation of content continued as a part of Unesco's Associated Schools Project in Education for International Understanding in 1953 and the 1957-64 Major Project for Mutual Appreciation of Eastern and Western Cultural Values, also by Unesco. An especially important geography component of the "Major Project" was the international exchange and review of textbooks for secondary school geographic education. Thirty-nine geography textbooks used in schools in Europe, Asia, and Latin America were reviewed by content and pedagogical specialists (Unesco, 1965). The "Major Project" provided authors and publishers with critical examinations of their books. The intent was to bring about improved accuracy, objectivity, and balance in the treatment of topics presented in textbooks and studied by secondary students. The

belief was that international understanding would be enhanced through objective geographic information and study. The groundwork and need for international exchanges had been substantiated by the Unesco activities and by the 1970s there were increasing numbers of bilateral and multilateral exchanges between countries to review textbooks and recommend constructive changes and revisions (Boden, 1977; Georg-Eckert Instituts fur Internationale Schulbuchforschung, 1985).

The interest with and participation in bilateral textbook exchanges involving geography emerged as a professional concern during this period. Three exchanges involving the US were particularly significant. They were with The Netherlands, the Soviet Union, and Japan. These bilateral exchanges were carried out in conjunction with history, such as the US - Netherlands Textbook Exchange (Matley, 1987) and the US - Soviet Union Exchange (American Association for the Advancement of Slavic Studies, 1981; Mehlinger, 1989), or under the umbrella of the social studies, such as the U.S. - Japan Textbook Exchange (Goodman, 1986). American geographers participated in the US - Netherlands Exchange (Ian Matley, Michigan State University) and the US - Soviet Union Exchange (George Demko, Ohio State; Robert Jensen, Syracuse; Joseph Stoltman, Western Michigan University), but were not included in the Japan Exchange. Each of the three exchanges had strong representation by geographers on the academic teams representing the other countries.

While some successes resulted from the textbook exchanges and the improvement of geographic content and information objectivity was documented (Maksakovsky, 1989), it was a slow process that fell victim to changing political climates, economic conditions, and textbook revision schedules. For example, the US - Soviet Union Textbook Exchange began in 1979 and wasn't completed until 1990. During that period a number of major changes had occurred in both countries. Political and educational restructuring were underway in the Former Soviet Union, and the educational reform movement with greatly increased attention to geography in the curriculum had emerged in the United States. The textbook exchanges had done what was possible and feasible. A new era, in terms of education and politics in each country, presented the possibility of undertaking joint curriculum development in geography.

The Joint U.S./Russia Curriculum Development Project

The Joint Curriculum Development Project was viewed by U.S. and Russian geographers as an opportunity and critical next step in the exchange between countries. For example, the changes in school geography in the United States and Russia indicated that new materials would be required for several compelling reasons. In both countries the students needed unbiased curriculum materials in geography. Students in each country needed to enhance their international knowledge of the other country in order to begin the long term process of reducing political tensions and overcoming stereotypes.

The U.S./U.S.S.R. Textbook Exchange Project had provided examples of textbook information from each country that were inaccurate and misleading. Not only had the textbook exchange projects been informative, but they also pointed out the need to begin with a fresh approach to materials development. Following are two samples from materials that were reviewed during the 1979 -90 period.

Soviet Criticism of a U.S. Geography Textbook
The Soviet reviewers reported: Many of the errors are connected with an ideological emphasis about the Soviet Union. State institutions allegedly are located only in the Kremlin, which is enclosed by a stone wall. Thanks to this, a dismal picture has developed of rulers partitioned off from their own people. The ten coldest cities in the world are located in the USSR - and the list includes Ulan Bator. In the text there are numerous factual errors. These errors are most abundant on maps. Take, for instance, the map of natural resources of the U.S.S.R. Kuibyshev is in Saratov's place, Baku at the mouth of the Kura, coal is not in Donetsk but on the lower Don, Chita and Groznyi are included among the industrial cities, but Sverdlovsk is not (Tiegs & Adams, 1983).

U.S. Criticism of a U.S.S.R. Geography Textbook
The U.S. reviewers reported: The following passage is from a widely used geography textbook in the USSR. "Urbanization in the conditions of capitalism gives rise to social problems. The conditions of urban life are systematically deteriorating. Houses in the central regions from which bourgeois families left for the suburbs are rebuilt by speculators calculating on the poverty of the population. Overpopulation increases and sanitary conditions worsen. The class structure of the population of the USA is typical for a developed capitalistic country. A small group of bourgeoisie (approximately 250 families of billionaires and millionaires, and a slightly larger segment of grand and middle-sized bourgeoisie) exploit the labor of millions of blue-collar workers, white-collar workers, and small farmers" (Maksakovsky, 1986).

The difficulties in continuing to use textbook materials in both countries that lacked objectivity and were riddled with inaccuracies was recognized as a serious issue. This was compounded by the changes in national educational priorities leading to the U.S. reform movement in which geography had an opportunity to gain considerably as a subject, and in Russia where the redefinition of curriculum through several variants was underway, and the preparation of new instructional materials was viewed as a necessity.

In 1991 the issue was addressed by a team of geographers from both countries. A plan was formulated to engage professional geographers and teachers to meet the following objectives.

1. To prepare on the U.S. side, a set of curriculum materials on the geography of the United States that could be used in United States schools and that could be translated for use in Russian schools.

2. To prepare on the Russian side, a set of curriculum materials on the geography of Russia that could be used in Russian schools and that could be translated for use in schools in the United States.

3. Each set of materials would have the unique quality of geographers and teachers preparing materials about their country for use by students in the other country.

A delegation from the Association of American Geographers met with geographers from the Institute of Geography, Russian Academy of Sciences, and identified and discussed the geography curriculum needs in each country. On the Russian side, the following points were identified.

1. Changes in the government and economy had resulted in a heightened interest in studying the United States, interacting with U.S. geographers and teachers, and in

developing exchange programs.

2. Anticipated political participation in local environmental, natural resource, and land use policy issues necessitated the inclusion of those issues in the geography curriculum.

3. The educational reform movement would greatly alter the content of textbooks, and it was opportune to provide new materials designed to present geography as an essential part of education for an informed citizenry, as a problem solving discipline, and as a discipline essential for informed decision making.

4. Geography is key to helping Russian students understand the world as it is and not as a means to support Marxist viewpoints. New materials are needed to move towards that wider understanding of geography and its role in society.

The needs that were identified on the United States side were also compelling in relation to the appalling lack of geographic knowledge among the school aged population in particular, the changing international dimension of the global economy, and the end of the Cold War. Specifically:

1. There is a renewed emphasis upon geography in the school curricula at nearly every level of education in the United States. Current, specially designed curriculum materials will generate enthusiasm for geography among students and teachers.

2. There is an increasing interest in U.S. secondary schools in advanced courses. There are few appropriate textbooks to meet this need, and high quality geography curriculum materials will become an integral part of newly established initiatives.

3. A better understanding of Russia is critical to U.S. students. In order for the relaxation of tensions to become permanent, future generations will need greater familiarity with Russia.

4. A major trend in the U.S. is for greater rekiance on non-conventional instructional materials. Instead, materials that engage the students in solving problems, testing theories, and using geographic skills for spatial information processing, and analysis using maps are gaining in usage.

Defining a Model for U.S. and Russian Materials

It was necessary from the very beginning of the project to design a model for the development and presentation of the materials. Such a model would make for a smoother transition between countries at the translation and adoption stage. Therefore, a basic components approach was used.

The materials being developed have five components: 1) a text of about 100 pages; 2) a detailed teacher's manual; 3) a book of related readings; 4) a set of classroom instructional activities; and 5) a resources and references manual. Each development team is preparing materials that include those components.

The model for the development also incorporated considerable flexibility in the ways the materials might be combined for classroom use. The organization of the materials by both the U.S. and Russian teams is topical, with regional patterns developed within the topical framework. The materials being prepared by both sides may be assembled for a geography course on the United States and/or Russia, or separate activities may be reconfigured to complement a world geography, global issues, or more specialized courses such as economic geography. They also provide numerous opportunities for student enrichment relative to both the topics included as well as related topics.

Materials Development: The U.S. Side

The availability of geography curriculum materials in the U.S. was evaluated, and the needs for particular topics was examined. Following those reviews, a project was designed that would produce the types of materials that would be useful in U.S. schools, but from which the Russian geographers could select components that were appropriate for the Russian geography curriculum. In that regard, the first priority of the materials production was serving a U.S. clientele. It was judged that materials designed appropriate for U.S. students could be adapted and translated without serious problems for use in Russian schools.

The materials development in the United States has been a combined effort involving the Association of American Geographers and the National Geographic Society's Alliance States, with funding from the National Science Foundation. The project that evolved is entitled Activities and Readings in the Geography of the United States (ARGUS). It includes the five components common to both sets of materials. The Classroom Activities that make up the instructional core of ARGUS present thirty topics that address various aspects of U.S. geography (Fig. 1). For example, each of the activities includes high interest, written narrative that addresses the topic (Fig. 2), high quality graphics that illustrate the spatial dimension of the topic or an issue related to the topic (Fig. 3), and a hands on exercise or problem that the student is requested to solve either individually or as part of a cooperative learning group (Fig. 4). Overhead transparencies useful for leading group discussions or presenting information are included in the materials (Fig. 5), as are suggestions for extending the discussion of the activity or comparing it to other situations (Fig. 6).

FIGURE 1
SAMPLE TITLES FROM ARGUS

Activity 1: European Colonialism - Site and Situation

Activity 2: Waves of Immigration - Flows of Immigrants

Activity 3: City to Suburb Migration - Land Use Change in the Suburbs

Activity 4: Physical Geography - Natural Hazards

Activity 5: Physical Geography - Climatic Graphs

Activity 6: Regional Primary Activities - Agricultural Regions

Activity 7: Heavy Industry - Industrial Location

Activity 8: High Technology Industry - High Technology Industry Location

Activity 9: Economic Control - Connectivity Between Places

Activity 10: Military Spending - Using Maps to Persuade

FIGURE 2

SAMPLE INTRODUCTORY NARRATIVE FROM ARGUS

J PHYSICAL GEOGRAPHY
ACTIVITY J2 - NATURAL HAZARDS

Background

What makes one place more valuable than another? Many people answer this question with a list of natural resources, such as warm climate, interesting scenery, a good harbor, fertile soil, mineral deposits, and so forth. Others think of theaters, sports stadiums, art galleries, and other cultural features. All these things increase the value of a place for many human activities. However, there is another side to the coin. A serious environmental problem or hazard can reduce the value of an otherwise good place.

For example, a field may be flat and fertile (which would be good for farming), but if it floods for several weeks after every big storm it will be less useful than if it did not flood. Likewise, a threat of snow avalanches in winter can make a valley site less desirable for a shopping center. In both cases, people who are aware of the hazard may be able to do something to reduce the damage. Identifying and measuring the risk due to natural hazards is an important job for geographers.

In this Activity, you will match isoline maps of risk with brief descriptions of several kinds of hazards. An **isoline** is a map line that separates places with a higher value from places with values that are lower than the value of the line. For example, a twenty-degree **isotherm** (isoline of temperature) should go:

1) directly **through** any place that has a temperature of exactly 20 degrees,

2) midway **between** two places with temperatures of 18 and 22 degrees, and

3) between two places whose temperature measurements were 19 and 24 degrees, but much **closer** to the place with the 19-degree temperature.

Maps rarely have only one isoline. The example below already has isolines for 15 and 25 degrees. The 20-degree line is just started. As you finish it, note that isolines cannot cross, though they sometimes curve around to enclose isolated areas of low or high value. Geographers use isolines for mapping things like rainfall, elevation, or population density. These features are measured with numbers, and they tend to change gradually from place to place (the natural world is not likely to have temperatures of ten degrees right next to places with fifty degrees).

Activity J2 -- Natural hazards   Page 1
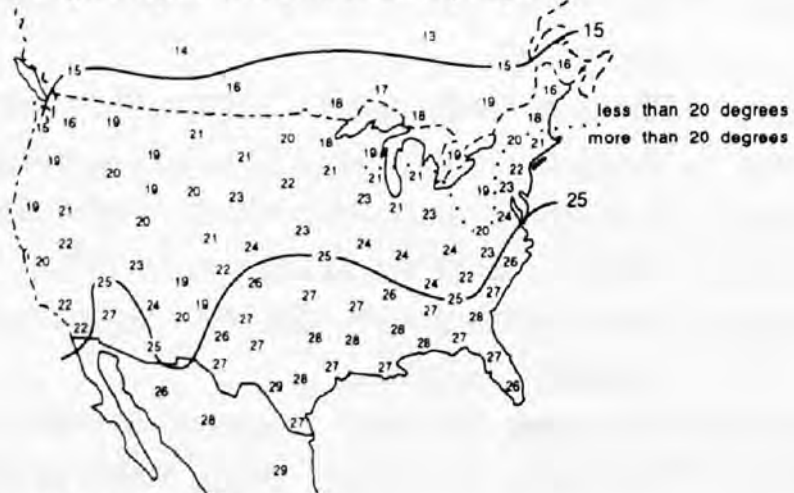
FIGURE 3
SAMPLE GRAPHICS FROM ARGUS

ISOLINE MAPS OF CLIMATIC HAZARDS (see instructions for key)

400 Miles

Sources: Visher, Climatic Atlas of the United States, 1966; U.S. Department of Commerce, Climatic Atlas of the United States, 1968.

Activity J2 -- Natural hazards   Page 3
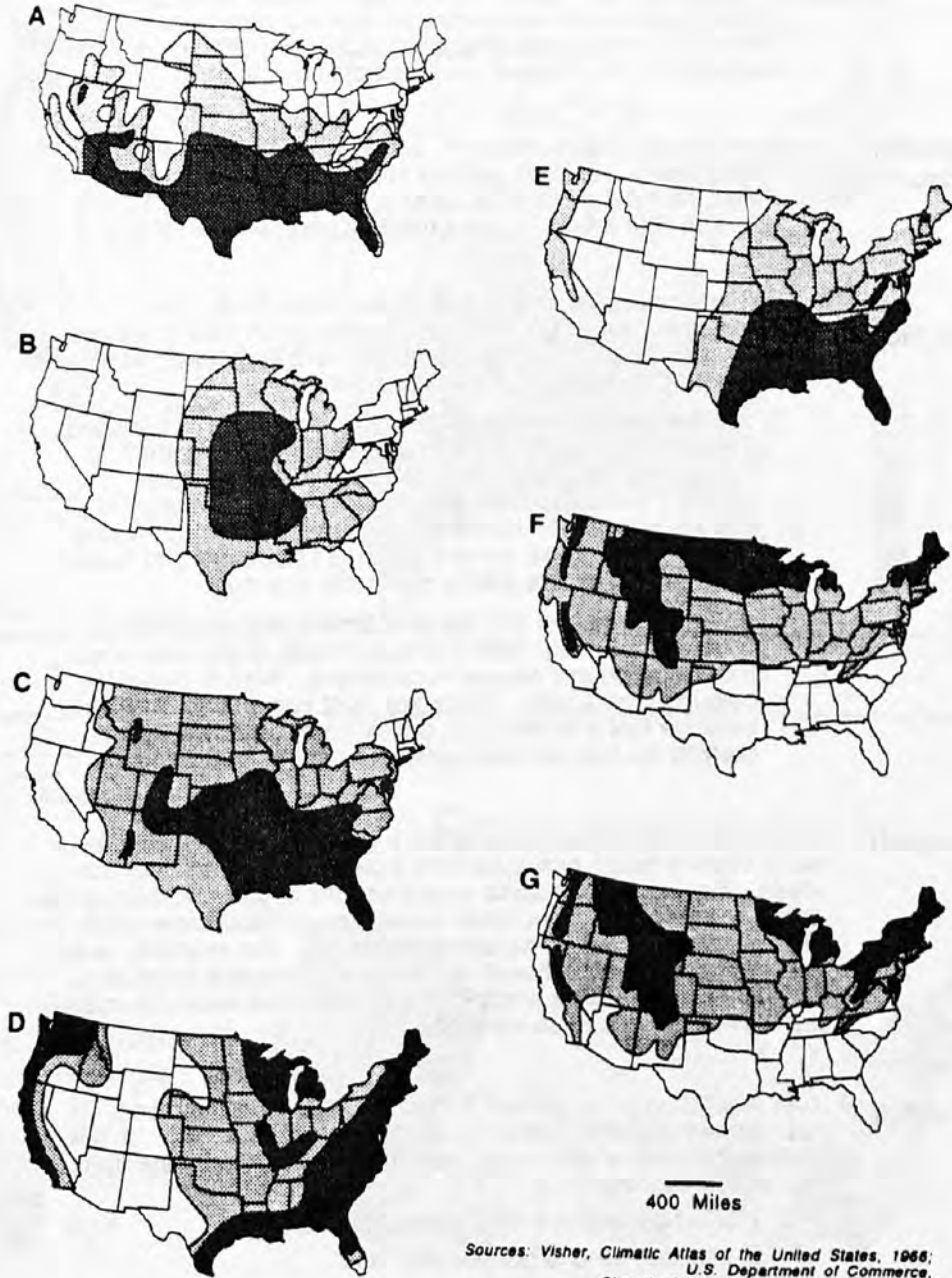
FIGURE 4

SAMPLE ANALYTICAL PROBLEM FROM ARGUS

INSTRUCTIONS FOR ACTIVITY J2

Situation
Some people are planning to build a resort hotel. They have asked you to advise them about what kinds of natural hazards they should discuss with their contractor and insurance company. The goal is to anticipate problems rather than deal with injuries and lawsuits if something unexpected should happen.

Information source
Maps of several natural hazards, with isolines that divide the United States into three parts of roughly equal size: dark ink shows the most dangerous areas in the country, a light color indicates safe areas, and the medium gray is in the middle.

Start
1) Examine each map and look for a pattern on it. For example, you might say that "the hazard in Map B is most severe in the Great Plains from Texas to Nebraska, and it is rare near oceans or in the mountains."

2) Think about what might be the major cause for each hazard. For example, what does it take to make a lot of snow? It has to be cold, *and* it helps to have a source of water nearby. What about tornadoes? They occur when cold air collides with warm, humid air. For this reason, tornadoes are rare in Montana (where the air is seldom hot and humid) or in Florida (where strong cold fronts are rare).

3) Match each hazard with the appropriate map and write a brief reason. Your reason should include statements about both **location** and **cause**: for example, "Map B shows the pattern of tornadoes. These are most common in the Plains, because that is where cold, dry air from central Canada is likely to run into hot and humid air from the Gulf of Mexico."

Research
You might have to read about some hazards in an encyclopedia or earth science book, or maybe form a discussion group to exchange ideas. For many geographic questions, the answer includes some scientific principles, some ideas based on what you know about different places, and some logical deduction. For example, what cities sometimes make headlines or news broadcasts because of deep snow or hurricane winds? These cities can heklp you locate the high-hazard areas on the maps.

Summarize
Your teacher may assign you a specific location for the resort. If not, choose a specific location, describe it carefully (e.g., in the northwest corner of Wyoming), and then write a short paper that explains three things:

1) *what* hazards are most serious in that place,
2) *why* they tend to occur there, and
3) *what* people can do to reduce the risk.

Activity J2 -- Natural hazards   Page 2

FIGURE 5
SAMPLE OVERHEAD TRANSPARENCY FROM ARGUS

50-Year Storm: 24-Hour Rainfall Expected Once in 50 Years

Source: U.S. Weather Bureau, 1971.

Earthquake Risk

Risk of Earthquake Damage

Low
Moderate
High

400 Miles
Same scale for Hawaii.

Sources: Uniform Building Code, 1991; NOAA, 1973.
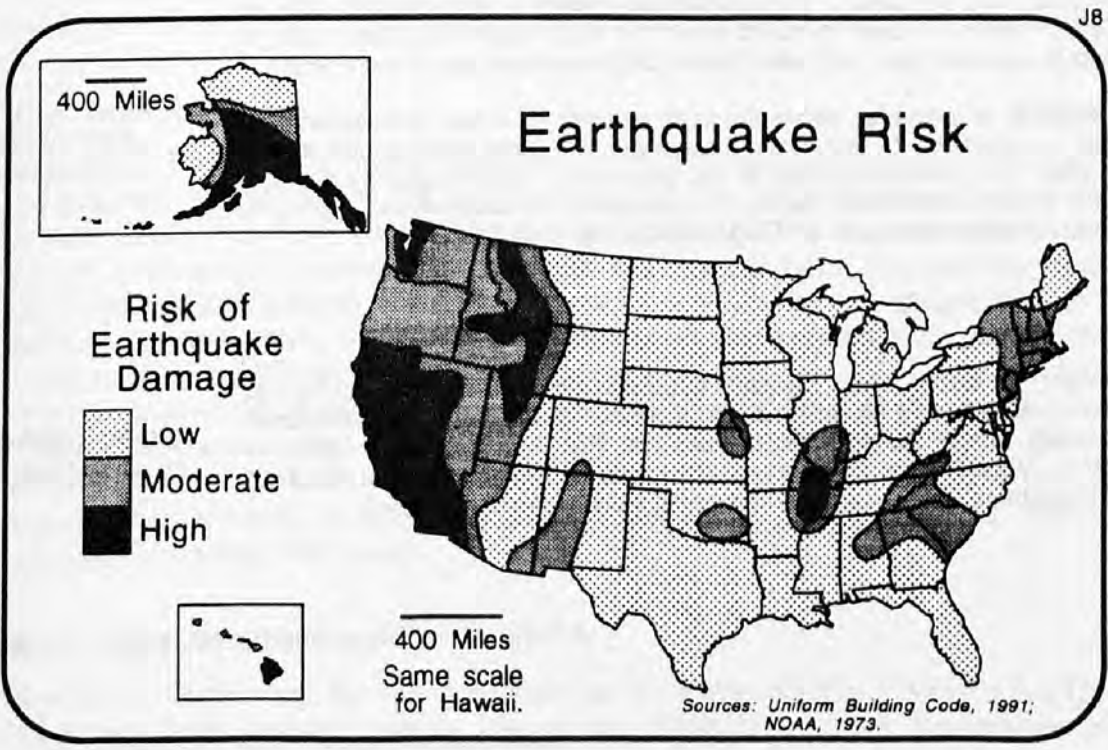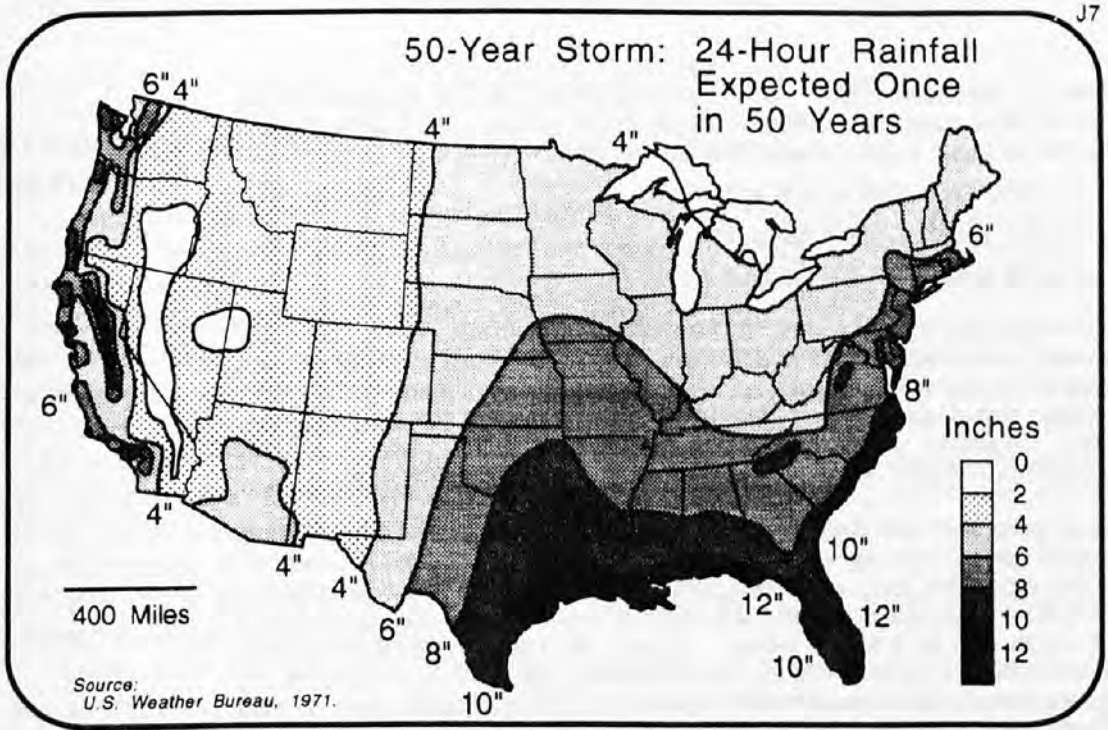
FIGURE 6

EXAMPLE FOR EXTENDING AND ENRICHMENT FROM ARGUS

One obvious extension of this lesson is to study several hazards in greater depth. Assign different hazards to different people in your class. Have them write a short paper or make a class presentation in which they explain three things:

1) *where* the hazard is most serious,

2) *why* it tends to occur there, and

3) *what* people can do to reduce the risk.

Another extension centers around the idea of hazard response: if the pattern of an environmental hazard is so well known, why do we consider many of them "Acts of God" for relief purposes? What options for mitigation are available? The course also deals with this idea in section W, but a discussion of hazard responses (warning, zoning, insurance, disaster relief, etc.) can be a lively and informative in-class activity the grows out of this matching exercise.

The basic purpose of this Activity is to get students to look *through* a hazard map and see the underlying maps of basic physical geography -- temperature, rainfall, elevation, etc. This gives a teacher a golden opportunity to remind students that one purpose of a geography course is to help us avoid the pain and cost of being caught unprepared by a natural hazard. In fact, for a properly prepared person, a big environmental event can be an exhilirating part of life. Students in Minnesota love to talk about how they went skiing during a big blizzard; Texans and Floridians gladly swap stories about a recent hurricane; Kansans boast about the wind; Californians often talk about where they were during the last earthquake; and so forth. This intellectual energy is too valuable to leave untapped, and it is easy to insert questions about cause-and-effect and get students to ask about the predictability/inevitability/avoidability of such events.

Ask students to speculate about the map patterns of some consequences of climate: avalanches (a late-winter phenomenon in steep western mountains), brush fires (a late-summer thing in the Southwest), crop-damaging droughts (summer in the Great Plains, fall in the Southeast), or ocean waves (spring in the north Atlantic, autumn in the Gulf, winter in the Pacific).

Underscore the role of climatic hazards in the economy and social life of various regions. What would be different about Miami if there were no hurricanes? How would history be different if the Great Plains did not have cycles of drought? What kind of influence do the snows of New England or the dusty smog of southern California have on regional architecture or literature?

Extension and enrichment

Coping with environmental hazards

Patterns of other climatic hazards

Concluding the Activity

Activity J2 -- Environmental Hazards   *Page T-4*

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Materials Development: the Russian side

The Russian team has prepared materials following a similar model. While not all of the materials prepared have been translated, there are English versions of three topics (Fig. 7).

FIGURE 7: SAMPLE TITLES FROM RUSSIAN MATERIALS

Activity 1: The Comparative Geography of the USA and Russia
Activity 2: The Center of Russia
Activity 3: Travel by Russia's Natural Zones

The Russian materials represent significant departures from prior textbook materials. They are designed to engage students in problems analysis, data collection, and problem solving and decision making. For example, in the Activity entitled the Center of Russia the students are provided data tables and maps showing the territory of the USSR, including historical data from the 1897 census of the Russian Empire. The students are then provided data analyzed by Dmitrij Mendeleev and Vladimir Semenov-Tian-Shan'skio, two eminent Soviet geographers. They are asked to compare their data analysis with the analysis of the geographers. In conclusion, the students are asked to consider, based upon the data they have analyzed, when and why the main shifts in the location of population and territorial centers occurred? A final question asks, "What was the influence of the dissolution of the USSR on the location of the centers of territory and population? Did Russia win or lose with these changes? What is your opinion?

Using data and following analytical procedures is a significant departure from the methodology and instructional materials used in Russia only several years ago. It opens a new approach to geographic inquiry by students in their study of both Russia and the United States. Therefore, the similarity of the instructional model employed in the project will result in classroom material usable in both countries.

Conclusions

The Joint Project is a major undertaking by the leading academic societies of geographers in both the United States and Russia. The immediate goal is to produce highly usable classroom materials with a topical orientation that reflects the current research and work of professional geographers. The second goal is to provide accurate and objective instructional materials about each country written by geographers in that country. Beyond those two immediate goals, one can look back at the UNESCO projects of the 1940s and 50s and realize that both countries still have considerable work to do with international understanding and knowledge about the people of each country by those of the other country. The materials being produced by the Joint Project between the United States and Russia are designed to enable students to take those steps towards greater international understanding through the study of geographic content and issues.

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THE SELECTION AND FITNESS OF
CURRICULUM GEOGRAPHICAL
CONTENTS IN THE XXIst. CENTURY

Gloria Leticia Zamorano de Montiel

1. The World Crisis and its Repercussion in Geographical Education in Argentina

1.1. The present political, social and economic changes

At present, in Argentina the geographical education is in a crisis process, that states essentially in the absence of adequateness of education to the recent political, social and economic changes happened in the world and in our country. This situation presents not only its own regional particularities, but also in the elementary, secondary and tertiary/universitary cycles.

At a world scale, the technological innovation of the last thirthy years, with the spectacular expansion of cybernetics and communications, it has produced deep changes in the direction of the state economy, it has transformed the frontiers and the limits of states and it has modified the customs of societies of rich and poor countries. Therefore Mr. H. Cleveland (1991) said: "The revolution of informatics not only has blurred the limit between inversion and speculation, but also changed the slowest world of the production and the interchanges of goods and services"..."Daniel Bell, the american prophet of the postindustrial society, predicted a long time ago a change in the nature of the markets from places to nets"[1]. This fact is already evident in our science in relation to the space conception: the importance of relative location is substituting to the preceding site valuation, that is to say, the exact and absolute situation of the different places in the terrestrial surface. People are less interested in the geographic coordinates or topographic conditions of such boundary, and reinforces, however, which is their present ubication relating to the main trade centers of the world, at what distance and in which direction it locates in relation to these sites and with others of the country, which degree of accesibility characterizes it and which are the more rapid, surest and cheapest ways of penetration. Obviously, this space interpretation is accompanied with a clear concept of time: just as people are interested in the time-distances, they also worry about short periods, the short-term profits and the rapid results.

On the other hand, this revolutionary vision of space and time has carried big transformations related to the concept of the wealth of the states, that does not center in the availability of resources, but in the good management of the information.

In our country, this disproportionate expansion of the communications and this overflow of information have provoked, moreover, great politic-administrative, economic and social transformations, with a remarkable repercussion in geographical education. The argentin government changed of nature in 1983 - from dictatorship to democracy - had as a consequence the beginning of a period of more liberty in the

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schools. In 1991-92, the transference of most of schools from national to provincial jurisdiction produced modifications in the geographic curriculum that have not yet ended. At the same time, the economic crisis and the measures in relation to the monetary stability have produced large budget restrictions in education, with the consequent reduction of the teachers salaries, of the equipments and of the available schools resources, specially in the institutions of public education. The social effects, as hunger and underfeeding expansion, increase of the quantity of daily work hours, growth of unemployement and subemployement, increase of delinquency, drug and alcoholism, have certainly also an incidence in the education.

For that reason, it is important to make a profound reflection about the fundamental principles of our daily exercise of teaching. The education enters into a context in which we must consider the psychological and pedagogical teachers criterions and their interpretation of the study programs, the psychological qualities of the students, the school characteristics -its specific degree, its particular manegement by the authorities-, the educational system -national or provincial-, the objectifs of the society and
consequently of its educational system, and so forth.

1.2. The present characteristics of geographical education
Even if there is a diversity of theoretical and methodological perspectives of Geography teaching, our science shows various common characteristics in the primary and secondary levels:

1.2.1. The annual programs and the textbooks of Geography have often certain misstatements:
- They are structured frequently in various units, with several subjects, so that students do not finish their plans during the scholastic year. They show an informative and encyclopedist Geography, that complies with the mere location of phenomena and does not penetrate in its correlation, explanation and synthesis.
- People appreciate in all the contents a marked preference for the natural facts -that clasps more thematic units and often the former-, to the detriment of human facts. They relegate to a last order the cast of social groups on the space. The contents develop in a rigid order, as an inventory that refers, first to the relief, next to the geological structure, later to the climate and so on, all of the physical features in the beginning, then the biological and finally the human characters.
- A tendency to prefer the exotic and far boundaries appears particularly in Geography textbooks for the secondary cycle. They underrate the well known and near places. In secondary provincial schools, however, the first year program has still since a decade as objectiv the study of local and regional environment, and insists to rebound the local contrasts of the different regions of Mendoza.
- In several times the teachers explain subjects that belong to other sciences, as biology or astronomy. These subjects are included like plasters not only in programs but also in handbooks.

1.2.2. The teachers, leaders of the teaching-apprenticeship process, are in the following conditions:
- Their grade preparation and post-grade formation is too variable, because some of them have graduated in the superior institutes of professorship, of a tertiary degree, and others come from humanity faculties. Only some teachers go to specialization courses of subjects they teach.

- Most of them teach numerous work hours, with different specialties, seldom concentrated in only one educational establishment, with none or limited extra-class hours, available for valuation and research tasks.
- Teachers earn meager salaries, which in some cases are a factor of indifference to the work they make. Consequently, they feel apathetic to the changes of the educational system.

1.2.3. The students, subject to the teaching-apprenticeship, are little stimulated and interested in the tasks they must carry out.

1.2.4. The equipments and resources are often scarce with exception of some schools, mostly private.

As a result, the present teaching is oriented to a static and routine Geography, characterized essentially with a great lack of creativeness, that does not fit to the present life conditions of the social groups in our present world. It is still under the influence of positivism and historicism.

2. The Epistemological and Methodological Backgrounds of Teaching

Two epistemological tendencies of the end of the last century and of the beginning of this century influence still in a decisive way, the present didactics of Geography: positivism an historicism.

2.1. The positivist frame in geographical education

Positivism is a philosophical tendency that appeared in the middle of XIXst. century. It rejects all incursions of human sciences in fantasy, religion or methaphysics. It considers that social facts follow a natural order that always tends to progress; this is a indefinite progress. Man must discover, analyze and accept this universal pre-established order in every things, that transform themselves into objects of knowledge.

"Positivism did not question how to construct the reality of the individual in his own mind. It supposed a freedom of values, neutral and objective knowledge; because the individual who knows could and must do without these values" [2]. Consequently, all men, as impartial observers of reality, understand the same facts, they have the same experiences and act in a neutral form.

The former development explains the basis of one facet in the present approach of Geography teaching in most of secondary schools. For the teachers who aim in this direction, the most important thing is the objective description of the phenomena, with a detailled exposition of the length kilometers of rivers, the inhabitants number of different cities, the highest hills names, et cetera. They aim is that the student should memorize lots of events in its whole. According to this discourse it should'nt behave in mind neither the interpretation nor the valuation of phenomena, because it means treating the reality with the subjectivity of whom practices the knowledge act. This fact signifies an ideological position for positivism defenders. Nevertheless, we coincide with Silvia Finnocchio in "while teachers follow identifying the science they teach with this pattern of thougth, we will transmit with a supposed objectivity a knowledge full of subjectivity and we will deprive ourselves of an enormous amount of ideas, explanations and interpretations that we can adquire from the disciplinary field" [3]. Under this perspective, we leave the integral development of the student,

also restraining the teacher possibilities of tending to his spiritual improvement, when he permanently valuates the apprenticeship results.

As positivism, teachers point the different program subjects by the inductive method, helping themselves with observation and description, and they arrive to generalizations without accomplishing explicative analysis. The geographic reality, as any natural or human phenomena, has a holistic object and it is not questionable, which can be removed in any part, because none of them has more or less importance than the others. This is the reason why the contents are imparted according to the plan order, without omiting none of them. Consequently, it is difficult, almost impossible, to attain teaching all subjects of the program during the scholar year. For it does not exist in fact a selection criterion of the geographic curriculum contents.

Nevertheless, we consider that it is indispensable to order and hierarchize contents, in view of a good geographical education, and then to choose the most adequate subjects to study. For example, if we study the oasis of Mendoza, we will emphasize the importance of water resourses manegement by men, and we could leave for a posterior course the problem of the excessive rainfalls of equatorial areas. On the other hand, it is necessary to take advantage of memorized knowledge as a basis or theoric frame for the students to elaborate the particular conceptualizations of the subjects. In the former example, to retain the meaning of terms like "oasis", "irrigation", "channels", will facilitate the understanding, then all the typical problems of a semidesertic zone like the province of Mendoza.

Finally, we must rescue from positivism the rigorousness of scientific knowledge, but not consider that this is absolute and invariable along the time, since the science principles, proceedings and attitudes must fit to the present moment and therefore in constant adequateness.

2.2. The historicist frame in geographical education

Towards the end of the last century and beginning of this one, historicism appeared as the perspective that was opposite to the positivism pretension of treating all the human phenomena with the same method as the natural facts. On the contrary, this position supposes that the individual is the subject who constructs the knowledge and maneges the facts with its conscience, by different processes. For example, intuition and empathy permit to understand the proper experience and live the experience of the others.

With an historicist point of view, according to the possibilities of the personal reality of apprehension, produces in itself a dichotomy: the natural kingdom, dominion of the necessary relations; the historic or social one, characterized by the relations of freedom.

With a methodological point of view, the spatial differentiation and association permit to define the landscapes and the regions.

However, the facts receive a different treatement according to their nature:

- The natural phenomena, product of regularities are subject to general laws, and therefore they could be explained. They respond to the simple relations from cause to effect, inheritance from naturalism.
- The human facts, unique and odd are the products of aleatory actions of social groups, who leave their seal in different places. Consequently, they could only be subject to the comprehension method, that permits the researcher basically reconstruction of the past of a region to recreate the present.

The teaching in secondary school has reinforced the dualist conception of reality, product of the influence of naturalism. On the other hand, Southamerica has lots of empty regions and enormous natural biomas. For these reasons, education is mostly aimed toward natural Geography, leaving human geographic studies relegated.

Otherwise, the appearance of historicism promotes the necessity of describing particular and different items. So, teachers teach mostly clasic regional Geography. They are more interested in forms than in process.

Regional aspects are reinforced, not caring about the limits of countries, states, provinces or regions. But in spite of this, they never intend to define these spatial unities: they fast accept this ideas as an inquestionable reality. In those areas they attempt to describe the singular combinations.

To conclude, as historicism supports that each person has its vision of reality, it constitutes a positive contribution toward the teaching of Geography. So that, this presents a more flexible and creative position, comparing itself to the stiffness of positivism. Nevertheless, its introduction shows through its mistakes, as the excessive subjectiveness, the inability to reach to the explanation in the treatment of human phenomena and the lack of definitions of terms. It constitutes, as positivism, a very plain approach of reality, that does not fit to the present conditions of geographical education.

3. The Change of the Teaching of Geography for the xxist. Century

3.1. The characteristics of the change

After all we have exposed, Geography, as all the subjects given in secondary school, should have a transformation specially in its teaching-apprenticeship process. Nevertheless, this change must be gradual to be effective. This modification should be done from its beginning in a change of scientific attitude of our discipline, that must be assumed the teacher and by the student. This attitude is critical, it is knowing to behave rationaly, it is knowing to difference between the fundamental and the accesorial and it is knowing to distinguish the good from the bad.

The student must begin his Geography approach from the knowledge of his environment, from the knowledge of the nearest and from his "experience of the vital frame" [4]. This will constitute for him the beginning to deepen different abstraction degrees toward the far and strange world, toward the most theoric and unknown one. So the student will construct or reconstruct the reality in his mind and will be able to adopt an evident critique attitude toward the knowledge that he will be acquiring and consequently toward life. It will be developed, then, not only his memory, but also his imagination, his critique judgment and his moral attitudes. To comply this objective, teachers and students must take into account not only the cognitive area and abilities objectives, but also the affective area ones. So people will understand not only the facts and principles of our discipline, but also the proceedings, abilities and dexterities, the values and attitudes.

On the other hand, it is necessary to adequate the teaching to the systemic approach, so that the geographical education will be really integral. This will permit consider not only the superficial aspects facts, their form, but also their structure, their articulation with other phenomena, and their processes, that is to say, their evolution and its reasons.

To conclude, they will be able to entail the theory with the practice through a good methodology: the science concepts will facilitate the daily resolution of life

problems. This can be attained, in fact, with internal and external transformations of Geography. Inside it, people must increase comparisons, explanations, partial and total synthesis. In relation to the other disciplines, it is necessary to integrate Geography into the global knowledge system of the secondary level curricula.

3.2. The population system in Eurasia
We will take a teaching unit example: the population system in Eurasia.
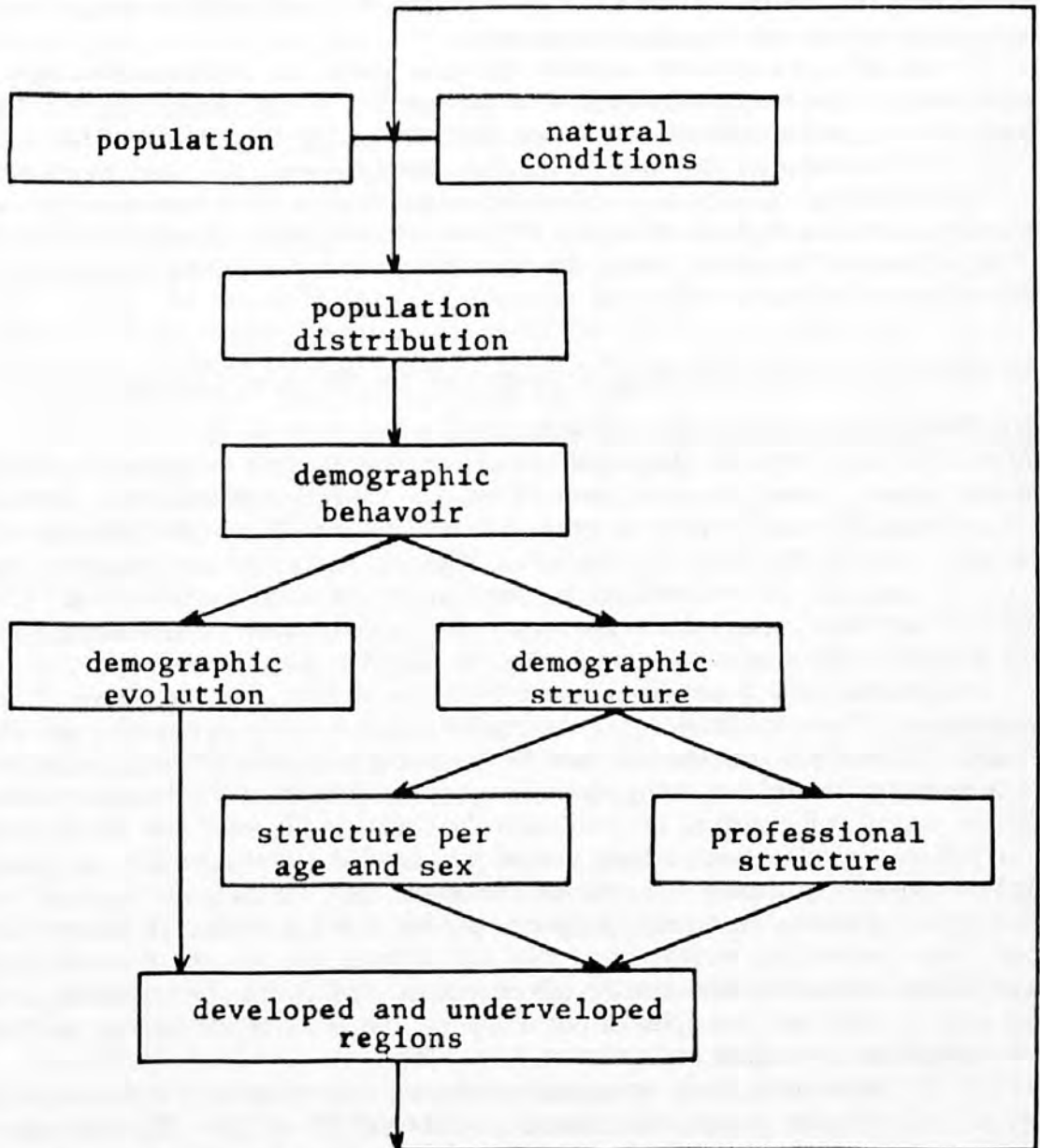
Figure 1: The population system

3.2.1. Situation of the teaching unit
Program: Geography of Eurasia
Number of unit: 1
Subject: The population system in Eurasia
Time: 8 weeks: 3 classes of 40 minutes (24 classes)
Level: 4th. year of secondary school
Age of the students: 16 years old

3.2.2. Specific objectives
- To know the population distribution in Eurasia.
- To differentiate the demographic growth stages of the continent.
- To recognize the demographic characters of developed and underdeveloped regions.
- To value the demographic behavior of the different regions and its consequences.
- To develop the ability to elaborate maps and graphics about Eurasia.
- To improve the capacity to understand texts, statistic tables, maps, graphics and videos in relation to the euroasiatic population problem.

3.2.3. Organizing concepts
The concepts that orientate the unit development are those that appear in the following figure. The principal subject in the population system is its distribution -easily visible in the cartographic sketch-, that represents the interrelation between human groups and natural conditions. That is to say in dispersed or concentrate form, people show particular demographic behaviors in the different areas of Eurasia. This is translated in a determined demographic evolution and structure pattern for the different regions. After considering population composition per age and sex and per occupational category, we can advance hypothesis about the developed and underdeveloped areas of the continent, that will be verified after the future information analysis. At the same time, the different economic development degree and the activities that are practiced in each zone promote demographic concentration or dispersion. In this process population system starts a feedback.

3.2.4. Apprenticeship activities

3.2.4.1. Introductory
- Proyection of slides about the different ethnic groups of Eurasia and their customs.

3.2.4.2. For analysis and experimentation
- Interpretation of a map about "population distribution in Eurasia", emphasizing the voids and the concentrations.
- Analysis of the different population subsystems their interconnections with the environmental conditions.
- Comprehension of demographic transition model and location of different groups of countries in the corresponding evolutionary stage.
- Elaboration of some population pyramids in order to observe if they are conformed to the old, adult or young countries pattern.
- Bond concepts of relative demographic structure per age and sex with population evolution ones.
- Construction of a triangular diagram to classify countries in different types of development.

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- Entail the different degrees of regions development with their demographic composition and evolution.
- Advance hypothesis to define regions with different levels of development.

3.2.4.3. For progressive integration
- Analysis of various information as statistics, bibliography or images, to verifie or not the hypothesis in the two following teaching units.
- Comparison between developed and underdeveloped regions with others of Argentina and in the world.

3.2.5. Apprenticeship resources

3.2.5.1. Books
- Benejam, P. et al., <u>Intercambio. Geografía humana y económica del mundo actual, Barcelona</u>, Vicens-Vives S.A., 1983.
- García Ballesteros, A., Redondo, A., <u>Hacia el hombre. Geografía 1</u>, Madrid, Alhambra, 1976.
- Lacoste, Y., Ghirardi, R., <u>Geografía general, física y humana, Barcelona</u>, Oikos-tau S.A., 1983.

3.2.5.2. Statistics
- The World Bank, <u>World Development Report 1992. Development and the Environment</u>, New York, Oxford University Press, 1992.
- <u>Almanaque mundial 1993</u>, Paraná, Editorial América, 1993.
- <u>El estado del mundo</u>, Madrid, Akal, 1990.

3.2.5.3. Slides, pictures

3.2.6. Evaluation
- Oral questionaires about different subjects.
- Written test to evaluate global knowledge.
- Valuation of students attitudes to approach development and underdevelopment problems.

4. Conclusion

To conclude, the selection and organization of the curriculum contents represent the first stage to future deep modifications in the teaching of Geography. So that this teaching process will be adequated to the various changes in the 21st. century.

These transformations should fit to certain conditions, such as those mentioned here:
- contemporary geographic approachs;
- present economical and politic situation of each society;
- valoration of the individual as a creator of common and different spatial world organizations;
- stage of psychological process of the student, according to former knowledge, his interest in different subjects and his attitudes toward the apprenticeship.

After all the concepts exposed, we can say that most of the changes would not be done without the protagonism of teachers. Because they are the leaders of teaching-apprenticeship process.

Notes

[1] Finocchio, S., <u>Enseñar ciencias sociales</u>, Buenos Aires, Troquel, 1993, p. 51.
[2] Angulo de López, M. et al., <u>Una tentativa local de renovación programática en Geografía</u>, in: Boletín de Estudios Geográficos, Nr.87, Mendoza, Facultad de Filosofía y Letras, 1991, p. 290-291.
[3] Idem [1], p. 55.
[4] Idem, p. 56.
[5] Bailly, A., <u>La organización urbana. Teorías y modelos</u>, Madrid, Instituto de Estudios de Administración Local, 1978, p. 180.

[1] Thurnley S., *Easy to read the graphic contour ...* Group, Editorial, ...

[2] Angulo de Haro, M. et al., *Informática en educación: la introducción de Geografía de Historia Geográfica ...*, Madrid ... Editorial & Planeta y Canal 1991 p. 203-204.

[3] ... p. 30.

[4] ... p. 30.

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...

...

- Thurnley S., ...

- Angulo de Haro, M., Escudero, J., *Informática en educación, Geografía e Historia* ...

- Lacoste Y., ... *Didáctica de la Geografía* ... ... Editorial, Oikos-tau ...

...

- ...

- ...

... Other Resources

- ...
  - One application for the different software
  - Allows the acquisition of new knowledge
  - ... students ... able to approach development and understanding more ...

Conclusion

In a suitable way the selection and organisation of the curriculum contents represent the first steps for better geography education in the teaching of Geography. So that this students remains able to respond to the several changes in the 21st century.

There are a lot of aspects which we consider important such as those mentioned before:

- ...
- ... of each society;
- ... of the individual ... common and different spatial world ...
- ... ... of the student, according to former knowledge, his interest in different subjects and his attitudes toward the apprenticeship.

After all the contents ... we can say that most of the changes would not be done without the involvement of teachers because they are the pillars of teaching apprenticeship process.

INTERNATIONAL TESTING IN GEOGRAPHY: THE INTERGEO PROJECT

Kenneth N. Purnell

Abstract

The outcomes of international tests are of interest to a number of educators and policy-makers. This paper outlines one project in this area, "InterGeo", which involves international testing in geography of secondary school students. An example of the data collected during the re-run of InterGeo II is discussed and an outline of the processes involved in developing InterGeo III is provided. A questionnaire on InterGeo II administered with national co-ordinators is discussed. The main findings are that the type of geography taught and learnt varies substantially between countries and often within countries. The average achievement of students in some countries on the re-run of InterGeo II differs significantly from those of the first group that sat the test in their country. Possible reasons for these variations are explored. Views on how the InterGeo project should progress vary widely among respondents to the questionnaire. The publication of the International Charter on Geographical Education (IGU 1992) provides a useful basis from which to develop a future international test in geography in the InterGeo project.

Introduction

The InterGeo project is an initiative of the Commission on Geographical Education of the International Geographical Union (IGU-CGE) which is keen to promote world class standards in geographical education in schools. Professor Gunter Niemz of Germany and Professor Joseph Stoltman of the United States commenced work on the project in 1984. They reported on the InterGeo project at the International Geographers' Union Symposium in Boulder, Colorado in August 1992 (Niemz & Stoltman 1992a). At that symposium David Lambert from the University of London, Christine Lee from the National Institute of Education in Singapore and I offered to continue the work on the project. In developing the project further we initially decided to:
- re-run InterGeo II with fewer countries involved
- administer a questionnaire to national co-ordinators who participated in the first administration of InterGeo II
- develop a new test with input from national co-ordinators and others interested in this project

This paper will outline the InterGeo project and give examples of data collected to date on the re-run of InterGeo II and the questionnaire administered to national co-ordinators. An overview will be provided of the processes involved in developing a new InterGeo test.

Outline of the InterGeo Project

International assessment of student achievement has generally been of mathematics and science (eg. the Centre for the Assessment of International Progress tests in 1991 of 175,000 nine and 13-year-old students from 20 countries). There are few studies reporting international assessment in geography (see Niemz and Stoltman, 1992b), though there are some tests in humanities (cf. Cheney, 1991). Gunter Niemz and Joseph Stoltman developed a multiple choice test in geography with the aid of colleagues from around the world which they trailed between 1986 and 1988. Field trials in 17 countries involving 2780 students were conducted with this first test "InterGeo I". Evaluation of this test suggested to those researchers that a test of 42 multiple choice items be developed which covered central concepts in geographical studies of location, physical geography, human geography; geographical skills, and regional geography. Most countries participating in the new test, "InterGeo II", also devised 8 items themselves to make the test a total of 50 items.

InterGeo II was administered in 1990 and 1991 in 23 countries to some 17,000 students in Grade 8 (or equivalent). The main objectives of the project were to assess student achievement in geography, to assist in the development of world class standards in geography, and to provide data which some countries may use to help improve geography curricula (cf. Niemz and Stoltman, 1992a). A number of participants at the IGU Boulder conference in 1992 indicated that the data collected from the test would be of use to them in developing geographical curricula in their country and be of assistance in influencing policy-makers. Others questioned the test's validity as it was not developed from a specific geography curriculum and expressed concern about the assumption that the life experiences of students who participated would somehow assist in compensating for this. Niemz and Stoltman contended that a geography test can be designed which is "broad enough to incorporate agreed-upon information, concepts, and skills representative of the discipline" (1992a, 7), and that geographical knowledge and skills is developed in contexts outside of classroom geography (eg. television, print media and other life experiences). InterGeo II was a test designed to be of "global knowledge that permeates all aspects of society" (Niemz and Stoltman, 1992a, 7).

Constraints on the development and administration of InterGeo II included data collection and processing. Niemz and Stoltman (1992a, 7) note that "in order to process the large amount of data, and to get objective results that would lend themselves to statistical analysis, it was decided to use multiple-choice items. Although such items have certain limitations, the project's funding and staffing levels made it impractical to use other forms of assessment". The sample of students from the population of all students in Grade 8 (or equivalent) in the world also presented these researchers with significant problems. They requested their colleagues in various countries to use students of "average ability in geography". However a number of the national samples were opportunistic. In future, this particular issue maybe met partly by asking national coordinators to stratify their sample into, say, three broad "ability" bands as shown in Figure 1.

Lower   Middle   Upper
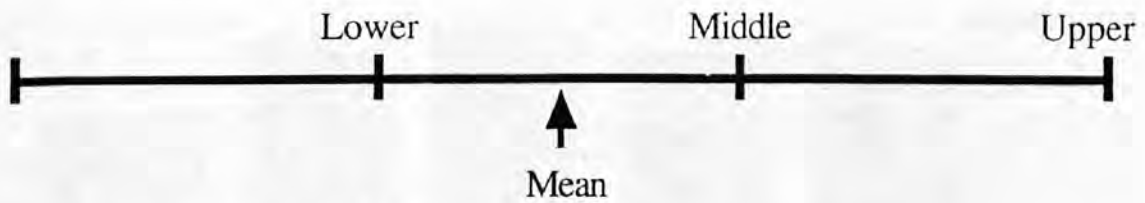
Mean

Figure 1: Ability bands of students

In reporting the results of InterGeo II Niemz and Stoltman (1992b, 13), found that:
The mean score of all respondents on Subtests 1-5 of InterGeo II is 57.8%. By
any measure, a mean score at this level should be viewed as unacceptable by
geographic educators worldwide. The test represents a standard agreed upon by
experts, and it was judged that 14-year-old students should know the types of
knowledge, understanding, and application incorporated in the test. That
expectation has not been met . . . Mean scores for physical geography, skills, and
regions subtests were all close to or less than 50 percent, a dismaying demonstra-
tion of lack of achievement . . . Baseline data such as those provided by InterGeo
II may provide one means to assess the effects of experimentation or changes in
the curriculum . . . Studies comparing international achievement in geography may
be influential for policy makers in their search for successful programs or
improvements.

As a first step in our involvement in overseeing the InterGeo project, David, Christine
and I invited national co-ordinators of InterGeo II to re-run the test. This was to
further raise awareness of InterGeo begun so ably by its originators. The data
collected in the re-run provides additional information on student achievement. To
date only a few countries have re-run the test. It is not our intention to provide a
table showing the relative achievement by country in the test. We are providing
individual countries with data on their students' performances and will provide global
data on the subtests and the test overall when this is available. An example of the
type of data generated and reported back to a country follows in Figure 2. This is
a graphical representation of student achievement for the five subtests for one
country.

Observation of Figure 2 suggests no difference in performance between males and
females in this country and this was supported by the statistical analysis
$[F(1,372)=0.09, p<.05]$. There is an observed poorer performance on regional
geography compared to the other four subtests and this difference was statistically
significant $[F(4,1488)=19.24, p>.01]$. The average score of males and females on the
re-run of InterGeo II in this country was 75%. The average for this country on the
first run of InterGeo II was under 60%. If the two groups of students were of similar
levels of achievement in geography then this may indicate something about the
reliability of the test. However, there may have been significant differences between
the two groups of "average ability" in geography. As more data comes in, a clearer
picture should unfold. Certainly national co-ordinators involved in the re-run of
InterGeo II may wish to share with other researchers their theories on causes of
significant differences in performance between the two test administrations of
InterGeo II.

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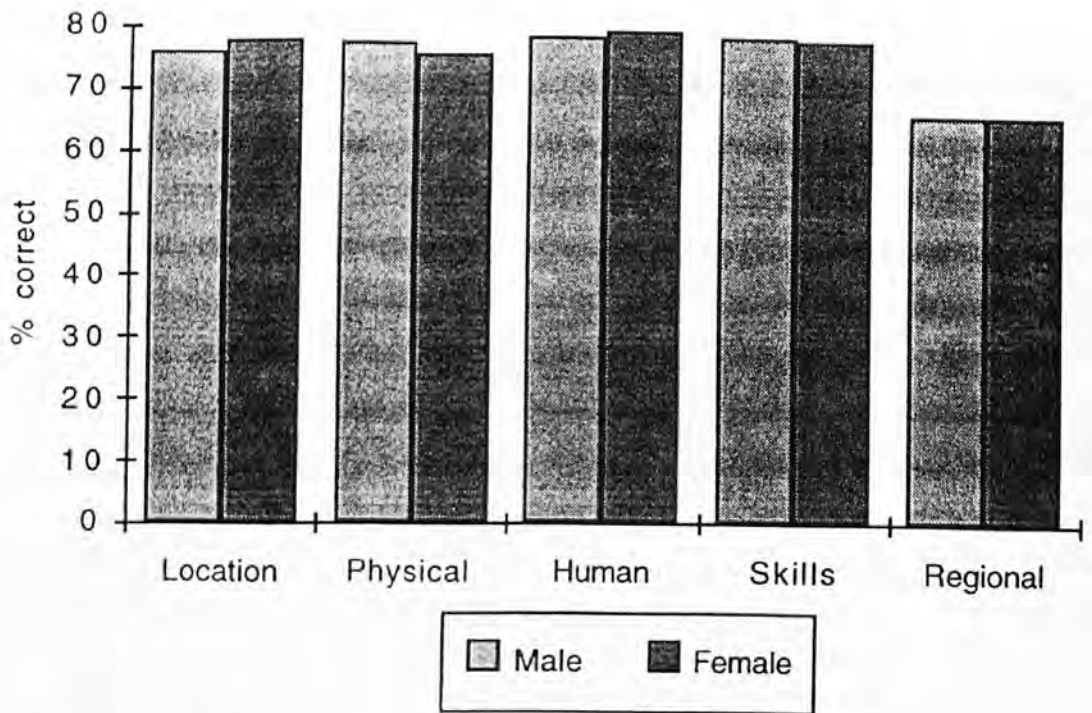
Figure 2: Student achievement in one country on the re-run of InterGeo II

Questionnaire on InterGeo II

A questionnaire on InterGeo II has been administered by Dr. Christine Lee from Singapore. The data is still being collected and will be more fully reported on by Christine in Prague. There were three sections to the questionnaire which was responded to by national co-ordinators (some national co- ordinators have asked teachers who administered InterGeo II in the classrooms to respond). Part one had 18 questions with responses recorded on a five point scale. The nineteenth question invited further written comments. Part two elicited general written comments on the test and included a request for items from national co-ordinators they would like considered for InterGeo III. The final part of the questionnaire asked about assessment practices and curriculum documents in each country that participated in InterGeo II. The response from national co-ordinators has been encouraging. The answers to individual questions vary substantially and a synopsis will be provided at Berlin. One fairly clear theme is that for a number of students doing the test it may not have covered a large proportion of the things they have done in their country related to geography. Certainly one could conclude from the responses to the questionnaire that the development and administration of InterGeo II as well as the administration of the questionnaire on that project has heightened geographical awareness internationally.

Towards InterGeo III:

In developing the InterGeo project further, David Lambert, Christine Lee and I intend to work with national co-ordinators and some experts in test construction to develop

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a new instrument. It is hoped that some of this work will be done in Berlin and Prague. The design criteria for the test will need to be identified. Some criteria might include that the test be an integrated whole, balanced with an appropriate range of items that are suitably difficult and discriminate between students, and that the test has both face validity and content validity and it is evaluated (Perhaps through interviews and/or questionnaires involving students and other participants in the project).

Important ideas on the administration of any new test and reporting of its results have come from a variety of sources. These include international developments in geography curricula and assessment strategies, the questionnaire administered by Christine Lee, and reports by Professors Niemz and Stoltman. The responses to the questionnaire have provided valuable information. For example, where possible, stricter sampling procedures will need to be employed in any future test, and the test should have and be seen to have high content validity. Gunter Niemz (personal communication November 23, 1992) in his bulletin to national coordinators administering InterGeo II notes that "in our discussions in Boulder we agreed that ranking nations according to InterGeo results is not advisable. For various reason these data cannot be regarded as representative of geographical (achievement) of 14 year old students in each country". We have decided with InterGeo III to not identify student achievements for individual country's. Grade 8 pupils involved in InterGeo II averaged 58% on the forty-two multiple choice items. Niemz and Stoltman, (1992b, 11) note that 70% of the 42 questions in InterGeo II were "knowledge", a quarter of questions were "understanding" and only two as "application". Such a heavy emphasis on testing "knowledge" has been questioned by a number of national co-ordinators. On the other hand some respondents to the questionnaire claim that the test was too broadly based and lacked specifics. It will be interesting to try to determine what geographical knowledge and skills could be reasonably expected of an international population to share. One recent study suggests that many international tests do not generate much information on a specific discipline such as geography but rather tend to replicate general patterns of international comparisons due largely to general national cultural characteristics (cf. Green and Steedman 1993). These and other related issues need to be addressed in developing the design criteria for InterGeo III.

Conclusion

The publication by the IGU (1992) of its International Charter on Geographical Education, as well as experiences associated with the development, administration and reporting on InterGeo II, provide valuable information on the purposes we may envisage for InterGeo III. In particular, the IGU charter envisages geography as an important part of the education of all young people and that "geography is a powerful medium for education" (IGU, 1992, p.7). It would appear to be appropriate for InterGeo to develop assessment instruments in an international context to examine and promote learners' geographical knowledge, skills, values and attitudes. One suggestion is the development of an international item bank based upon the IGU's international charter from which countries could choose and develop their own test. This and related issues need to be addressed as InterGeo III unfolds.

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ENVIRONMENTAL CONCEPTS
AS THE BASIS FOR COMMUNITY BASED
TEACHER EDUCATION IN PERU

John Wolforth

Abstract

An experimental teacher education program in Peru used a combination of college based courses and distance education to prepare village teachers. The modular curriculum on which the program was based contained geographical elements, since teachers were intended to become active participants in community development. An analysis of the attitudes of four cohorts of teacher trainees showed that teachers generally had a stronger attachment to, and confidence in the future of the Andean region. It also showed that they had an allegiance to local cultural values and a belief in education as a means of passing on these values.

Introduction

In the period 1987-1992, McGill University and the Pontifical Catholic University of Peru worked together to develop a unique system for training teachers in the Andes. Their collaboration was funded by a grant of almost $500,000 CAN from the Canadian International Development Agency (CIDA) under its Educational Institutions Program (Canada, 1988). The purpose of the grant was to bring together expertise in Canada and in Peru to address a problem which is common to many developing countries, to provide community based teacher training which enables unqualified teachers to gain the skills and knowledge to do their jobs more effectively, and to earn the credentials which give them professional standing in their community.

The system that was developed was based to a certain extent on the program which had been created at McGill to serve aboriginal communities in Canada's far north. The key elements of this program are that it depends almost entirely upon courses being delivered in the teacher-trainees home community, and that it places a very strong emphasis on the cultural and linguistic characteristics of that community (Wolforth 1991). In Peru, it was necessary to adapt this approach in order to accommodate to the geographical conditions of the region in which the program was to be delivered and to the characteristics of those who would participate in it.

The training program that was developed in the McGill/Catholic University CIDA project attempted to develop a curriculum which was strongly rooted in the community in which teachers would eventually work, both in terms of the Quechua language used and in terms of the content. This inevitably caused us to inject a large environmental element into the curriculum. In this paper, I should like to comment briefly on the approach taken towards environmental issues, which was essentially to

have the teacher trainees, and through the trainees the children and the communities, begin to understand the environment in an active way, to generate community strategies for using the environment for sustainable development. Secondly, I should like to comment on a few aspects of an analysis of the teacher trainees attitudes which seem to have particular bearing on the way they view the local region vis-a-vis the wider national scene and on the characteristics of the trainees which seem to favour a stronger allegiance to the local region, including its culture and language. First, however, it is necessary to say something about the curriculum and the delivery system.

First Year	1.	Ecogeography of the Andes	2.	Learning Techniques
Second Year	3.	Research on the Community	4.	Economy and the Community
Third Year	5.	Technology and Community	6.	State, Region and Community
Fourth Year	7.	Culture and Community	8.	Profile of the Andean Child
Fifth Year	9.	Cosmovision of Andean Region	10.	Education and Community
Sixth Year	11.	Consolidation of Training	12.	Project on Education

Table 1: The modular curriculum

The Modular Curriculum and Distance Education

The curriculum which was developed for training rural teachers is organized into 12 modules, each devoted to a particular theme related to the Andean environment and to teaching in the region. The decision to work within the structure of a modular curriculum required a radical reorganization of the way in which information is presented to teachers in training in the universities and pedagogical institutes of Peru. Rather than following traditional school subjects, the curriculum was organized around certain themes corresponding to aspects of the reality of the Andean world and to the practical demands of the rural teacher's life (See Table 1).

The concept underlying the curriculum, derived from the work of Freire (1990) is that the goal of education should be individual empowerment leading to actions resulting in community development. Each module was structured around an "action guide" which was intended to have the teacher investigate a particular problem which his/her community may be experiencing, and initiate some means by which this problem might be addressed or ameliorated. The knowledge and skills which the

teacher is expected to learn and to pass on to his/her own pupils are subordinate to this overriding goal, rather than being justified in their own terms.

The delivery system developed for the program reflected this strong emphasis on the local community. Initially the program was conceived as being entirely structured around distance education, with the teacher-trainees completing all their studies in the home villages. Unfortunately, projects based entirely on distance education have frequently failed in Latin America, and in other parts of the developing world, because students find it hard to work in isolation and often drop out. In order to counteract this tendency, a three pronged method of program delivery was developed, each prong organized around a different mode of delivery. The students began each year of the program with courses delivered on the campus of a small teacher training college in the town of Urubamba, Cusco Department. They began work on distance education materials only when they returned to their home communities and in this phase of their work, the one in which students may easily become discouraged and drop out, they were supported by visits from supervisors who reviewed their teaching techniques and assisted them with their distance education materials. These three complementary systems (regular course delivery on campus, distance education and one-on-one counselling) are described below.

Residential Phase
In the first part (January-March) of each of the six years of training, the teacher trainee participates in regular residential courses given at the Superior Pedagogical and Technological Institute in Urubamba (ISTEP). The courses taken by the trainees are intended to introduce them to the material and to the theoretical constructs that will be developed at greater depth in the remainder of the year. The constructs are grouped into two modules, so that at the end of the six year training program the trainees will have dealt with the entire twelve modules shown in Table 1. As the trainees pass through the program, the modules are related to each other so that they are encouraged to see the interrelationships between the themes they are exposed to, and to integrate them into their practice. Each module has three elements, based on the notion that teachers must learn to see, to judge and then to act. They are trained to observe the Andean environment, to make judgements about what they observe based on relevant theory and then, most important, to develop actions which can be taken to bring the people of their home community and the environment in which they live into a relationship which favours the sustainable use of resources.

Distance Education Phase
When the teacher trainees return to their villages for the remainder of the year (April-December), they enter the distance education phase of the program. Teacher trainees come from Cusco Department and from the adjacent parts of neighbouring departments, areas of very poor roads and of no reliable system of postal or other means of communication. Of course, very few of the villages have electricity or telephone service, so the challenge of delivering distance education materials is enormous. Even an initial suggestion that teachers should pick up their distance education materials when they came into the regional education centres to pick up their salaries was not possible in practice. Many teachers were in areas so remote that they simply do not come out at all during the school year, and have a friend or relative pick up their meagre salary. The solution lay in having itinerant pedagogical counsellors, initially employed as part of the project but later put on the permanent

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staff of ISTEP, visit each teacher trainee on a regular basis. The advantage of this solution was that these individuals not only delivered distance education materials, but also provided invaluable support for the teacher trainees by giving them feedback both on their work in the classroom and on the tasks they are expected to perform as their distance education assignments.

Community Action

As mentioned above, these tasks are structured around a so-called "Action Guide" in which the teacher trainee carries out an investigation of some problematic aspect of the local community, develops pedagogical strategies for involving the pupils in this investigation and in the community development project which is intended to flow from it. The main focus of the distance education phase is therefore directly related to the needs of the community, and to which some of the theoretical ideas dealt with in the residential phase might be applied to meet these needs. Given this emphasis on community action, it seemed inevitable that the focus in most of the 12 modules should have a strong geographical element. Most of the problems experienced by the Andean communities, whether of soil depletion and erosion, the loss of forest cover, adaptation to flooding and to mudslides, the migration of young people to the cities, getting goods to markets, all have a basis in geography.

Geographical Content

The module with the strongest geographical content is that entitled the "Ecogeography" of the Andes, and since it was the first module developed, it can be examined in some detail in order to illustrate the approach taken and to show how environmental issues play a large part in the development of the approach which is directed towards community action. During the Residential Phase teacher trainees study the Andean environment in terms of the so-called "axis of reality" and the "axis of theory"(Patino, 1992).

Under the "axis of reality", the trainees consider the Southeastern Andean Region as an ecosystem. In particular the consider the variety of habitats which exist in the Andean region, related in particular to the major altitudinal zones, and to the constraints and opportunities offered by the Andean environment. They then look at the Andes in relation to the other major regions of Peru, based on the conceptions of Peruvian geographers (Pulgar Vidal, 1987) They examine the major types of campesino communities in terms of the relationship between human occupance and altitude. For the Andean region, these comprise the Quechua Region (2500-3500 m.) of "tierras templadas", the region with the most benign climate and greatest agricultural potential, the Suni or Jalca Region (3500-4500 m.) of "tierras frias" where agriculture and pastoral activities are becomes marginal, and the Puna Region (4000-4800 m.) or barren altiplano. Finally, they look in detail at the occupance patterns of Andean river valleys.

In a parallel fashion, the teacher trainees examine certain theoretical ideas under the "axis of theory" that help them understand this content material better. They look at the concept of system and of the differences between natural, social and mixed systems and then try to apply these ideas to what they have learned about the Andean region. They look at the concept of a river valley as a set of interacting natural and social conditions, preferably in equilibrium. Finally, to bring the empirical and the theoretical together, they look at the concept of energy as one of the most important linkages within natural systems. Even in the residential phase of their training pro-

gram, there is considerable emphasis on practical applications. Thus, as the culmination of the work in the this area, they look at the construction of various devices which can be built to harness solar energy, including a drying rack for corn, a simple solar powered water heater, and a solar drier for vegetables and other foodstuffs.

In the distance education phase, when the teacher trainees are back in their home villages, the emphasis shifts more strongly to the practical since the distance education materials are intended to lead the teacher trainees towards some form of community action. In the distance education materials, teacher trainees are presented with three levels of problem as illustrated by an example from Module 1. First, at an investigative level, they ask: What is the relationship between various elements which may be associated with some eventual action? In the example from Module 1, they focus on the factors related to the production and use of plants in the community. Second, at the pedagogical level, they try to engage children in this investigation in a way that will lead them to identify some problematic aspects of this relationship and begin thinking about possible solutions. In the example, they have the children classify local plants and through careful observation, relate these to the soil, site, micro-climates in which they thrive. Finally, at the practical level, they try to get both the children and the whole community involved in some community project which will use the information which the children have generated. In the example, they develop a plan of work for the construction of a community tree nursery to be used for reforestation.

Analysis of Teacher Trainees' Attitudes

One of the expected results of the project was that teacher trainees would be more receptive towards the values of the Andean region, and would regard the region in a positive light. As actors and initiators of community action, it was hoped that they would be disposed towards thinking of change in a positive way, at least as far as the local region was concerned where it is presumed they would feel they have some control over the direction of change. In order to investigate the attitudes of the teacher trainees two questionnaires were administered, one in February 1990 and the other in February 1992.

Both questionnaires were administered to a group of trainees who had only just entered the program and to another group of those who had been in the program for one year. In the 1990 survey, the groups consisted of the trainees who had entered the program in January 1990 (N=43) and of the group that had entered the previous January (N=21), the group that had in fact initiated the program. In the 1992 survey, the groups consisted of the next two cohorts of trainees, those who had entered in January 1992 (N=35) and those who had entered in January 1991 (N=26). Both questionnaires were designed to elicit attitudes on a number of statements relating to the role of the teacher in the community.

In the 1990 questionnaire, these attitudes related to an ideal role, and the trainees were told[1]: The following statements define the ideal teacher. Mark with an X your degree of agreement with each statement where A indicates "completely in agreement"; B, "in agreement"; C, "indifferent"; D, "in disagreement", and E, "totally in

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[1] All statements and questions were of course in Spanish.

disagreement". The questionnaire contained 20 statements. The respondents were also invited to make a comment expressing their views on each of the statements and, in a separate question, to say what the future would hold for Peru, and for the Andean region. In the 1992 questionnaire, the same 20 statements were listed with four additions for a total of 24, and the same five point Lickert Scale was used. The 1992 questionnaire also elicited information on the degree of the trainee's facility in Quechua, and asked respondents to make a distinction in their response to each statement as it might apply to an _ideal_ and a _real_ situation. For each statement, the trainee was asked to give two sets of responses, one "in my actual situation" and the other "in an ideal situation". The intention of this division was to see if the trainees aspirations might be different from what they saw as their role within the constraints of the real world.

How did the trainees feel in the 1990 survey about the future of their region and of their country? The results of this question were informative in that they showed the trainees were more positive about the future of the region than of Peru as a whole. Interestingly, the second year trainees were even less positive about the future of Peru than the first year trainees, and somewhat less positive about the future of the region (See Tables 2a, 2b and 2c).

	Positive	Negative	Neutral
About Peru	20%	52%	26%
About Region	57%	33%	12%

Table 2a: Responses of the whole group (n=64)

	Positive	Negative	Neutral
About Peru	30%	35%	32%
About Region	62%	27%	11%

Table 2b: Responses of the first year trainees (n=43)

	Positive	Negative	Neutral
About Peru	0%	85%	15%
About Region	43%	43%	15%

Table 2c: Responses of the second year trainees (n=21)

Some of the verbal responses give a flavour of why the trainees saw the future of their country in such a negative light, since they seem to foresee a continuation of the current rather depressing trends. It should be remembered that the questionnaire was administered when the country had gone through a devastating period of hyper-inflation and when the activities of the Shining Path movement seemed to be immune to government action. Against this background, the trainees said of the their country's future:

There will be a big crisis due to overpopulation and the scarcity of food.
There will be chaos and people will emigrate to the cities.
There will be social conflicts if the situation of injustice does not change.
The country will be more under-developed because of government corruption (First Year Comments).

The country will be going through one of the worst economic and political moments of its history.
Peru will suffer a great disorganization politically, socially (and) culturally.
It will be a country where education will only be available for the upper classes.
There will be an increase in population and not enough land (will) be available.
The situation in the country will be worse because of the immorality of politicians (Second Year Comments).

About the Andean region, the expectations of the future were more mixed and included many that were positive, with such typical comments as:

It will be better in means of communication.
There will be better education for more people.
(There will be) better socio-cultural development due to education in accordance with their reality.
The community will be better organized (and) people will be more interested in their children's education.
It will get better as long as teachers keep in teaching the cultural values of their communities.
There will be some technological advances, but nothing to make life better.
The community will be poorer since farm production is decreasing every day.
There will be more poverty in our community (First Year Comments).

The community will be forgotten by its political leaders.
There will be an increase in population, more poverty and hunger (and) the resources will not be enough.
The community will be affected by the national situation, since we are part of the country.
It will advance because it will produce its own resources.
Better education will bring better conditions of life in all areas such as health, economics, etc.

It will be a district where the campesinos will value their natural resources and will fulfil their needs with satisfaction.
It will change for the better thanks to the Andean teachers (Second Year Comments).

Not surprisingly, the ranking on the Lickert Scale of most of the statements was positive since the all but a few were intended to be uncontroversial[2]. Both First and Second Year Trainees agreed that teachers hold power in their communities (78% agreed); are agents of change in the community (95%); prepare their students for work different from that of their parents (71%); work for change in society (95%); take part in all aspects of life in the community (92%); transmit respect for the Quechua language (93%); transmit respect for campesino life (97%); motivate their students to ask questions (97%); have an influence on their students which is greater than that of the parents (77%); present to their students alternative ways of living (92%); and initiate their students to the Peruvian national culture (80%).

The more telling responses were those that were negative, or in which there was a difference between first and second year trainees. Less than half of both groups agreed that teachers represent the national culture rather than the local culture, and only about a quarter of both groups that teachers teach only the Ministry of Education official curriculum. Although only 13% of the first year trainees agreed that teachers prepare their students for life in the city rather than life in the rural areas, 48% of second year trainees agreed that this was the case, a discouraging response given the main thrust of the program to strengthen the rural base by fostering an education stressing local values and local resource use.

At face value these results are surprising, since it would seem that it is the neophytes who have more confidence in the future of their region, and even about that of their country. They also seemed less disposed to believe that they should prepare students for living in the city. On the other hand, both the first and second year groups seemed to have a belief in the importance of the local culture and of a curriculum which expresses a local rather than a centralized perspective. In the analysis of the 1992 survey some attempt was made to tease out these apparent inconsistencies, by relating the trainees' responses not just to their time in the program, but also to their facility with the Quechua language. Although the training program has a strong emphasis on bilingualism (Quechua-Spanish), recognizing the linguistic realities of the Andean villages, not all trainees are Quechua speaking, although all have some facility with the language since it forms an integral part of the program. In the two cohorts surveyed in 1992, 44.2% said they were native Quechua speakers or spoke the language with ease; 26.2% that they spoke Quechua only fairly well or with difficulty; and 29.5% that they spoke only a few words or phrases. The analysis (Table 3a and 3b) showed that responses were affected both by the degree of facility in Quechua, and by the time the trainee had spent in the program. The analysis touched on aspects other than those which have to do with their attitudes towards the region and the country, but only the latter will be dealt with here.

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[2] This paper will deal only with the few questions in which the analysis was significant and which touched on attitudes towards the region or the environment. There were other results which were interesting, but go beyond the scope of the present paper.

ROLE OF THE TEACHER	Var.	F	p
Has power in the community	Year	7.62	.008
Prepares students for life in the city	Year	4.85	.032
Only teaches Ministry curriculum	Speak	4.02	.023
Takes part in political activities	Speak	4.99	.010
Influence on students greater than parents	Year	4.37	.041

Table 3a: Responses related to the actual situation[3]

Represents the local culture	Speak	3.82	.008
Is an agent of change in the community	Speak	6.67	.007
Prepares students for life in the city	Year	5.37	.024
Works for change in society	Year	5.02	.029
Takes part in political activities	Speak	4.07	.022

Table 3b: Responses related to the ideal situation

In their responses to the statements about the situation as it applies in reality, the length of time they had spent in the program had an effect on whether trainees believe that teachers have power in their communities; prepare students for life in the cities; and have an influence on students that is greater than that of their parents. In their responses to the statements about the situation as it might apply in an ideal world, the length of time they had spent in the program had an effect on whether teachers should prepare students for living in the cities; and whether they should work for change in the community. The degree of trainees' facility with the Quechua language, on the other hand, had an effect on the extent to which they agreed that teachers should represent the local culture; should be an agent of change; and should take part in political activities.

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[3] Var.= Which independent variable, year in the program or the facility with speaking Quechua, has a significant effect on the dependent variable, mean response to statement indicated. F= F value with 1,55 degrees of freedom for the "year" variable and 2,55 degrees of freedom for the "speak" variable. p= probability of covariance being by chance.

Conclusions

The results of this analysis seem to indicate that the approach taken by the program is succeeding in some of its objectives, especially in that trainees appear to have a commitment to the local region, and to the local culture and language. One of the expectations of the program was that, if teachers were trained in a way that stressed the local rather than the national environment, they would be more likely to create an expectation that young people could remain in the Andean rural areas rather than joining the migration to the cities, and especially to Lima. This expectation seemed to be more strongly based among the trainees fluent in Quechua, who nonetheless made a distinction between the real situation and what they felt that situation should be. The Quechua speakers seemed much more idealistic in their approach and in their belief that teachers should actively work within the parameters of the local culture, to improve the living conditions of the local environment.

Although the project did not have a specifically environmental or geographical focus, since it was intended to develop a teacher training program more suited than existing Peruvian programs, to the preparation of teachers to work in rural villages. Nonetheless, by focusing on the geographical elements, attention may be drawn to some broader questions. In the context of the developing world, should teacher training be specifically directed towards the knowledge, skills and attitudes which are most conducive to sustainable development? Can geography play a role, not as a discipline providing inert material to be mastered for its own sake, but as a source of useful concepts which can be applied directly to the solution of local environmental problems?

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GEOGRAPHY EDUCATION IN THE SCHOOL CURRICULUM FOR THE NEW SOUTH AFRICA - A COUNTRY IN TRANSITION

Mike Smit

Abstract

The existing geography curriculum in South Africa is currently presenting various problems. To overcome these problems and to develop a new core geography curriculum is not an easy task and curriculum planners should involve all the role players of all the different population groups. The aim of this paper is firstly to show what contribution geography education can make towards educating the people of this country. Secondly the most important problems in drafting a new geography curriculum will be high-lighted and thirdly important guidelines for the development of a new geography curriculum will be recommended.

Introduction

In world perspective, South Africa is often called the "apartheid" country, or the country of great contrasts. From a physical as well as cultural viewpoint the above cannot be denied. It is above all the diversity of its physical and cultural environment which is one of the most important characteristics of South Africa. Unfortunately these terms have developed a negative connotation for many people, referring for them mostly to White minority rule, the segregation of people according to race, colour or ethnicity, the oppression of the less privileged, disparities in the distribution of wealth and even violence. Political pressure from other countries has lead to the fact that sanctions in the areas of trade, politics and even academics, to name but a few, became commonplace and South Africa became the skunk of the world. On 2 February 1990 apartheid was abolished by the current national government in South Africa and reform became the key word in the so-called "new" South Africa.

When Table 1, which indicates the population composition of South Africa, is studied and together with that the fact is kept in mind that 27 political parties (which represent 33 different religions) have already by March 1994 registered for the country's first fully democratic elections on 27 April 1994, the complexity of the South African situation will certainly become more clear for many uninformed people. The fact that 70,6% of the total population is Black and that they also maintain the highest growth rate (2,68%) is a clear indication of future tendencies.

For a multicultural South Africa to cope successfully with its various domestic problems, which have been accumulating over a period of more than three hundred years, and to participate effectively in all world affairs, its leaders and people should have a coherent knowledge and understanding of all the different regions and nations

Tabel 1 POPULATION FIGURES : MID-YEAR 1993

	1970	1993	1970-1993
Whites	3 864 000	5 149 000	1,26%
Coloureds	2 170 000	3 402 000	1,97%
Asians	652 000	1 022 000	1,97%
Blacks	12 525 000	23 016 000	2,68%
TOTAL	19 211 000	32 589 000	2,32%

(Central Statistical Service, 1993)

of the world. The ability to deal effectively with the multiplicity of problems we face, requires an increasing international competence. However, to maintain and increase this necessary competence means the educating and training of an ever-increasing number of South Africans to enable them to be able to understand other people and societies well enough to be able to work effectively with them on political, economical and welfare issues.

There can be little doubt that geography both as a subject for study in schools and as a scientific mode of inquiry can be used to satisfy the need to know about other people and places, the natural environment, and the capacity of the earth to support human life. Geography as a discipline is, on balance, better equipped for the analysis of the subjectivity of place and of the environment than it is to global theorizing. Geography, therefore, should be seen as one of the core subjects in a curriculum for the new South Africa.

The Importance of Geography as a Core Subject in the Curriculum for a Country in Transition

According to the International Charter on Geographical Education (IGU/ CGE Charter, 1992) Geography, is a synthesizing discipline which focuses mainly on two dimensions namely people and environment; or human geography and physical geography. Taylor says it short and sweet - *Geography is about the world* (Taylor: In: Gregory & Walford, 1990, 303). Geographers, therefore, are well trained to analyse and integrate the physical, biological, and social factors and processes which affect the use of resources and space. As far as South Africa is concerned geographers are particularly well placed to provide and apply the necessary skills to address many of South Africa's cultural and environmental challenges. With reference to Americans' ignorance of their own country and of the world, the Guidelines for Geographic Education states:

Geographic education is vital to correct this ignorance and can give future generations the knowledge and understanding they need to manage the earth's sources wisely (Guidelines for Geographic Education, 1984,1).

A mission statement by the National Assessment Governing Board, U.S. Department of Education states that the purpose of geography

> ... *is to foster development of citizens who will actively seek and systematically apply the knowledge and skills of geography in life situations* (National Assessment Governing Board, 1994, 9 - Pre- Publication Draft).

The International Charter on Geographical Education (IGU/CGE Charter, 1992, 5) describes Geography as the science which explains the character and the distribution of places, people, features and events as they occur and develop over time on the earth's surface. Geography is also concerned with interactions between humans and their environment in the context of place, space and location. Therefore geographers ask the questions what, where, why, how, what impact does it have and how should it be managed.

When one analyses the International Charter on Geographical Education (IGU/CGE Charter, 1992) it is very clear that geographic education is fundamental to the future well-being of all societies and countries of the world, especially South Africa. Geographic education also makes an important contribution to environmental education, which is not a subject in itself but a function of education with a content that is drawn from the whole curriculum, especially from Geography. Central to both geography and environmental education is the desire to encourage an interest in the interaction between people and their environment and to gain knowledge and understanding of the processes shaping it. This is underlined by the Department of Education & Science (DES), National Curriculum which defines geography as a bridge discipline

> ... *that can contribute to teaching and learning across the curriculum, notably in the vital and topical area of environmental education* (Department of Education & Science (DES), National Curriculum (1990, vii).

Now, more than ever, citizens of South Africa and especially the generation of young people should realize that effective communication among different communities as well as effective interaction with their environments are of the utmost importance for the future of a peaceful South Africa. It seems to be clear that one of the most crucial phases in South Africa is the preparation and education of a generation of young people towards better understanding of man's responsibility in society as well as in and towards his environment. As South Africa in the 1990's is confronted with serious problems regarding population dynamics, urbanisation, socio-economic disparities, poverty, unemployment, crime, illiteracy, environmental problems, education crises, economic disparities, drought, air and water pollution, squatting, and public health, to name only a few, geographers and geographic education can contribute significantly to the analysis and solution of these problems (Cf. McCarthy & Rogerson: In: Rogerson & McCarthy, 1992, 6). The International Geographical Union Commission on Geographical Education proclaims therefore the International Charter on Geographical Education

> ...*to all governments and peoples of the world and commends the principles and practices presented in the charter as the basis on which sound geographical education in all countries should be maintained* (IGU/CGE Charter, 1992, 17).

Problems Facing the Current Geography Curriculum

As South Africa is in a process of constructing a new education system and thus new curricula, it is of the utmost importance that the mistakes made in the past should not be repeated. When one analyses the position of geography in the school curriculum it becomes clear that various problems are presently being experienced in South Africa. The most important problem is the fact that the present geography curriculum is the result of a top to-bottom approach, meaning that it is mainly the work of university academics. Research which identified and pointed out the problems involved in this type of approach was ignored and very little of the recommendations made by the researchers were implemented in the revised syllabi (Cf. Ledger, 1978; Nightingale, 1985, 89-91). It is of fundamental importance that a bottom up approach should be followed when constructing a new geography curriculum for a post apartheid South Africa.

Secondly, a situation analysis which was done by the Department of National Education (1993), indicated that there are at present a large variety of school subjects in the school curriculum of which the objectives and content overlap to a great extent (Kriel 1992/93, 142).

Thirdly it seems that the current educational dispensation cannot in terms of manpower needs fulfil the requirements of certain institutions, and also that a too large number of learners receive academically-oriented education. The curriculum is therefore not seen as equally relevant by all learners and the perspectives of sub groups in the community is not being reflected (KOH:1991).

Other important points of criticism lodged against the current curriculum came from the National Educating Co-ordinating Committee (NECC). They claim that the entire process of syllabus development is dominated by Whites; that there is no national core curriculum; that there is a wide variety of syllabi; that differentiation according to race is emphasised to the detriment of communality and that true curriculum development does not take place, merely curriculum revision (NEPI, 1992). When the last new Core Syllabus for senior secondary school geography was introduced in 1985 it was criticised by Nightingale (1985, 89) as only a revision (*and not a drastic one*) of the syllabus adopted in 1975. Nightingale concludes his criticism by saying:

I have instanced the New Geography as a sad example of a golden oppor-tunity missed (Nightingale 1985, 89).

According to the African National Congress (ANC's Discussion Document on Education 1994, 67) the current curriculum has been unresponsive to changing labour market needs and has failed to contribute to the development of learners who are being prepared for the world of work and for active participation in the process of social and economic development. The lack of relevance of the curriculum has been exacerbated by the narrow base of participation in the process of curriculum development, seeing that parents, teachers, students, workers and the private sector have not been involved (Cf. also Nightingale, 1985, 89-91). The ANC's Discussion Document (1994, 68) criticises the current curriculum as being exam-driven. A teacher-centered and authoritarian learning process is the result, with the focus on rote-learning and the absorption of facts rather than the development of critical thinking, reasoning, reflection and understanding. Substantiation for this argument was made by Ballantyne (1987/88, 109-110) when he stated that, although South African geography education has undergone considerable changes in aims and content

during the past two decades, geography education is still seen to be in the second phase of Graves' typology due to teachers' general adoption of a directive, teacher-centred approach in the classroom. Ballantyne also refers to Hartshorn (1986) when he states that a major reason for the maintenance of second phase characteristics in South African geographic education is that

... the structure and control of education lies firmly in the hands of politicians. Political control of education is extensive and changes to the system are politically, rather than educationally, motivated (Ballantyne (1987/88, 113).

Although I do not agree with all the above-mentioned statements the fact is that South Africa is in a process of change and the criticism and the contribution of all role players should be taken into account in constructing a new school curriculum. If all the competent geography educators, and there are many in South Africa, would be willing to contribute constructively to the process of change, effective new geography syllabi which will effect the lives of millions of children could be the result.

Guidelines for Geography Curriculum Development in South Africa

Seeing that South Africa is on the eve of an election which could drastically change the future of the country, it would be unwise to venture a prediction on what education in this country would be like in future. Norman Graves said in his opening address at a National Subject Didactics Symposium in South Africa:

I am aware that the rate of change in your country is so great that what is true of today's conditions may not be true tomorrow, or next week, or next month. Yet one needs to plan on certain assumptions about society and its education system (Graves, 1990).

Therefore, regardless of who the new government will be, it is important that the following principles regarding curriculum development, as stated by the Committee of Heads of Education Departments (KOH, 1991, 49), should be used as point of departure for a new geography curriculum development policy. The same principles are applicable to the development of a geography syllabus. The comments following each principle is that of the author:

Curriculum development should take place according to scientifically based principles.
Well-planned situation analyses, identifying all the problem areas in the current geography curriculum, should be the first step be undertaken by experts of the subject as well as curriculum experts representing all population groups. The distribution of a few questionnaires among specific role players in an effort to identify new aims and new con-tent for a new geography curriculum is at the very least a naive method - unscientific and the way of least resistance.

Curriculum development should take place in a coordinated way and all interested parties must be part of the decision making process.
According to the Discussion Document of the ANC (1994, 68) the process of curriculum development must be democratised through the participation of all stakeholders. This does not currently seem to be the case in South Africa.

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Curriculum development in South Africa should take place according to a unique style.
Due to the ethnic and cultural composition of the South African population and the differing developmental levels of the people, geography curricula should be adapted to the needs of people in a specific region. A study of geography teaching in Israel (Cf. Bar-Gal, 1993, 64-68), as well as the study of curriculum development which have been established in many overseas countries, as well as in some neighbouring states (e.g. Swaziland and Zimbabwe), could be of great benefit (Nightingale, 1985, 91).

Curriculum development should be viewed and undertaken as a continuing process.
The process of curriculum development is not simply a circular system moving from objectives to evaluation and so on, but a dynamic inter-active system in which every part affects every other part. Continuous evaluation of the curriculum in necessary to enable curriculum developers the opportunity to improve or to change the curriculum.

Curriculum development in South Africa should be based on thorough research.
Not only should research on geographical education in South Africa be taken into account, but also recent research done on the international scene, e.g. England. and Wales where recent curriculum changes took place. The Geography National Curriculum (GNC) in these countries was criticised by many geographers in England. According to Robinson one of the major points of criticism was that

> *...Geographers and geography teachers have been completely outmaneuvered in the creation of the Geography National Curriculum (GNC). We have been used and divided, and in the final phase dismissed as irrelevant. The government had clear objectives from the start ... to the final censorship ... The results of democratic consultation procedure were not allowed to interfere. One may not be happy with the GNC, but one must agree that it was derived from a process of manipulation and authorian decree. We now have a GNC with no legitimate pedigree* (Robinson 1992, 31).

It is of great importance that the pitfalls mentioned in this paper should be seriously considered by the drafters of a new geography curriculum for South Africa.

Centralisation with strong regional decentralisation will be a necessity.
Seeing that South Africa will be divided into a number of different regions with strong decentrali-sed governments, it is to the utmost importance that a core curriculum must be developed which could serve as basis for the development of geography syllabi at regional level.

Curriculum development should fulfil the demands and needs of the community.
Special consideration should be given to the inclusion of the central role of values and attitudes in human geography and the validity of learning geography through the study of issues relevant to the pupil and the future of his world.

The user of the curriculum should have the right to participation in deliberations and a strong democratization of the curriculum development process should be accepted.

In constructing a curriculum for geography in the new South African all role players in a new educational dispensation should be consulted so that the process towards a truly democratic geography curriculum will be legitimate. The impression must not be created that the present Department of National Education (one of many) is hijacking this process.

Although I agree that we cannot sit and wait for a transitional government to initiate new curricula, I have serious reservations regarding the legitimacy of the present attempts to involve all role players and non-governmental organisations. There is no sense in putting untold effort into so-called discussion documents which in the end will be disregarded when true discussions under a new authority gets under way. Present frustrations can be minimized if the process for the drafting of a new geography curriculum is initiated by the Transitional Executive Council and not by one of the Departments of Education.

The drafting of a new geography curriculum should be based on a rationale generally accepted by geographers on an international level and it should reflect recent developments in geography teaching. The Charter referred to in this paper provides such a rationale. From the preface of the Charter it is evident that what it stands for should be acceptable to every person seriously concerned with geographical education, irrespective of his/her political conviction. Concepts mentioned in the Charter has the potential to satisfy the most divergent views when writing a preamble, aims and objectives and selecting the content for a new geography curriculum.

Conclusion

We are not living in particularly happy times. Political, demographic and cultural forces are working inter-related. Combined, they dictate the lives of millions of people as well as the direction and rate of change towards the achievement of an education system for the new South Africa. The hard-nosed accountability movement is with us and we need to face it.

Although it is impossible to predict the exact form of education in a multi-cultural society, fundamental change must occur and the process of education and curriculum development should take place along the lines of acknowledged scientific curriculum principles. Curriculum planners must make the effort to develop curricula that will address the needs of present and future societies, so that we do not fail future generations. The curriculum therefore, needs to be both practical and theoretical since these are two aspects of transferable knowledge and skills which will enrich our students intellectually and materially.

Lastly, when new geography curricula are to be developed the International Charter on Geographical Education should be used as a guideline for the development of a new geography curriculum and specific efforts will be needed to ensure the dissemination of the new geography curricula in all schools.

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SCHOOL GEOGRAPHY IN A NEW SOUTH AFRICA
CHALLENGES AND RESPONSES

Theo Smit

South African's ignorance of their own country, it's peoples and of the world will have dire consequences to the nation's future, welfare, strength and unity. Geography is vital to correct this ignorance and give future generations the knowledge and understanding they need to manage the country's and earth's human and natural resources wisely. Everyday important decisions are made affecting man's well-being and everyday geographical knowledge or important geographical influences are encountered which have a bearing on the quality of life. In a democracy, development of compassionate and effective public policies depend upon active participation of citizens who are broadly educated about their own society and its relations with the entire world. All events affecting society occur within a geographic context and to understand these events fully, they must be subjected to geographic scrutiny. Throughout the world, and in South Africa, there is a growing awareness that the life support systems are under severe strain. The exploitation of resources, both human and physical, and the abuse of ecosystems is undermining the ability of the world to provide a decent livelihood for it's rapidly growing population.

In South Africa in particular, the rapidly changing socioeconomic and political scenario presents an exciting challenge to which school geography must respond. It is evident that the academically orientated eurocentric geography curriculum does not address the needs and valuesystems of the multi-cultural society in South Africa where a restructured pre-tertiary education system envisages access to and equal opportunity in education for every pupil irrespective of race, creed or sex.

The challenge to which school geography must respond features in the important paradigm shift proposed in the 'Curriculum model for Education in South Africa' (CMSA) by the Committee of Heads of Education Departments from a predominantly academically-orientated education system to that of a more general and vocation-orientated approach (Department of National Education, 1991: 10). The importance of the languages, mathematics and natural sciences as fields of study is emphasised and this view is endorsed by the National Education Investigation Policy (Neppi) (NECC (b), 1992). This educational paradigm shift, brought about by sosio-economic, political and personpower needs, directly influences the relevance of geography as a school subject. This proposed paradigm appears to disregard the fact that training in geography gives students a unique perspective about places and their relationships to each other over time. In fact, it is an essential ingredient in the total process of education.

In a positive sense this development can be regarded as a blessing in disguise. The 'lost opportunities' so aptly described by Nightingale regarding the 'revised' 1985 core geography syllabi for Standards 5 to 10 should not be repeated in the 1990's (Nightingale, 1985: 89). Ironically, three of the aims of the 1985 core syllabus did

in fact make provision for future socio-political and economic events but were sadly neglected due to inherent structural and content deficiencies and ineffective methodological approaches. They are:

"... (to) adjust to a society that is undergoing rapid and far-reaching social, economic and political changes ..."

"... (to) enter the world-of-work that is becoming increasingly more technologically orientated ..." and

"... (to) develop their moral and emotional (affective) attributes."

(Department of National Education, 1985: 2)

The school curriculum is central to the education process. It has important social and political dimensions (NECC (a), 1992). A new, not a revised, school geography curriculum policy must take cognisance of prevailing circumstances and should integrate the goals for future democratic development. School geography must, however, take note of the pitfalls which may arise in the proposed educational paradigm shift which according to Graves, can be viewed as instrumental in nature (Graves, 1984). Such an instrumentalist view of education is non-functional in practice where the reality and probability of shaping individuals to fit into a series of occupational and role niches in society is questionable. A mass of evidence around the world, apart from a handful of countries, shows that attempts to provide concentrated vocationally-orientated education in sch Qols have not succeeded (NECC (b), 1992). The primary task of the school, and this is the challenge to which school geography must respond to in a democratic non-racial South Africa, should be to lead pupils to see beyond what is to what should be; to question established views and practises; to suggest new solutions to old problems, and to see solutions in situations which others accept as problematic. A highquality general education is essential in order to create 'technologically literate' and adaptable workers who are highly trainable and both able and prepared to carry on learning new knowledge and skills throughout their working lives (NECC (b) 1992).

In the afore mentioned proposed curriculum model (CMSA), geography is grouped with history and economics, as social studies in the social science field of study from grades 4 to 9. In grades 10 to 12, it is also grouped in the social field of science but as an independent subject with history, economics and religious studies (Department of National Education, 1991: 26, 30). However, despite its attributes as a discipline and as a contribution to the vocational scenario (South African Geographica.1 Society 1991; Van der Merwe 1990/91) it is excluded from the vocationally-orientated subjects which is defined as "... primarily concerned with the application of knowledge and skills in the world of work." (Department of National Education, 1991: 40).

However, other relevant policy statements do indicate a role for geography in a future education dispensation. Statements, from the NEPPI document (NECC (a), 1992) which are of particular importance, include the following:

– "a... which reflects the norms and values of a nonracial, non-sexist, and democratic society and which is relevant to.. the needs of the individual as well as the social and economic needs of society"

– "general education integrating academic and vocational skills which will prepare individuals to adapt to the needs of a changing and dynamic economy and will ensure equality of opportunity"

– "the development of a national democratic culture which allows for cultural and regional diversity".

Other statements which are relevant refer to CMSA's broad aims of education (Department of National Education, 1991: 61, 62):

– "... *preparation of learners for ... successful existence in the world by providing them ... (with) the necessary basis for further development, occupational competence and economic independence"*

– "... *education.. towards responsible and useful citizenship so that they will understand, respect and conserve the world they live in, be willing and able to render service to the community, the nation, the country and the world ... be able to fulfill their role in life ... and make a positive contribution to the whole".*

These statements clearly imply a very important role for school geography. A positive response regarding amission statement, rationale, aims and objectives, content, methodology and assessment is essential. It must be justified in terms of the needs, skills and transfer thereof, attitudes, values and in particular, problems and possible solutions to be faced in South Africa in the next number of decades (Wesso in Rogerson and Mc Carthy, 1992). School geography must also recognise that there are important social and political dimensions to a curriculum and the manner in which knowledge is organised is also a social activity which produces a social product and should therefore be integrated with future social development (NECC (a), 1992).

The challenge is to make school geography sufficiently dynamic to address the needs of the individual and that of society in the South African context within the parameters set by proposed educational aims by both institutionalised bodies and NGO's. If these challenges are ignored, the status of schobl geography in South Africa may follow the same pattern as in the USA, France, Germany and to a lesser extent, England and Wales, where school geography is not viewed as such an important element of the curriculum (Graves, 1984).

School geography is essential in the education process of citizens in South Africa because an essential educational entitlement of every child is the study of the changing relationship of mankind to a wide range of global environments. Geographers are interested in the physical, biological and climatological components as well as the social, economic, technological and political frameworks which exist. Such knowledge is vital if mankind is to manage properly the environment, develop its resources, mitigate the effects of hazards and promote an awareness and understanding of the needs and aspirations of all peoples (Bailey and Binns, 1987: 327). These are all issues which are very relevant in a emerging new South Africa.

The broad nature of the geography curriculum, as bridgediscipline, however, presents a problem in deciding what should be taught in the school. An important guideline in selection of content and approaches should be to identify and provide a central focus for school geography in a South African context. In this regard the role of geography in the general education process and the identification of the central concepts to be taught in school geography require careful consideration. Two important interrelated yet separate elements are distinguishable and also require attention, namely, that geography is a science which seeks to explain the character of places and the distribution of people, features and events as they occur and develop over the surface of the earth and, secondly, that geography is concerned with human-environment interactions in the context of specific places and locations and has its interest in the future management of people-environment interrelationships (Commission on Geography Education, 1992: 5).

In brief, the primary role of school geography education is to present information and facts about the world and to introduce and reinforce the concepts of place, relationships within places and the movement between and among places and a region; to examine values and attitudes towards environments and to sharpen intellectual and practical skills (Association of American Geographers, 1984: 10; Boardman, 1986: 19; Commission on Geography Education, 1992: 7, 8). School geography must recognise the pluralistic nature of a multi-cultural society using the unique South African setting to enrich pupils' education. In addition, geography inquiry should promote active questioning using geography's organising principles and skills. Citizens need such principles and knowledge to make personal and societal decisions in using the environment in an accountable manner, resolving conflicts among competing values and groups and learning to co-operate with people of different cultures (Association of American Geographers, 1984: 10). Of paramount importance is the realization that the acquisition of knowledge, the development of cognitive skills and that of the affective domain cannot be isolated from reality. School geography must take cognisance of the process whereby future citizens acquire the knowledge and skills necessary to perform both occupational tasks and other social, cultural, intellectual and political roles that are part of a vibrant democratic society. In this regard Wesso (Wesso and Parnell in Rogerson and Mc Carthy, 1992) states "Motivation for the continued place of geography in local schools must therefore address the personal needs of individuals and their role in wider society. "

School geography can meet these demands. In this regard, an account of the case for school geography, summarised by Bailey and Binns, is of paramount significance and requires careful consideration (Bailey and Binns, 1987: 328 - 331). The aims and objectives of school geography does offer the opportunities to meet the previously mentioned demands. In the first instance it does provide the knowledge for the need of an individual to understand his or her place in their locality, their nation and the world; to give insight into the lives of others who may have different lifestyles and cultures; provide the knowledge to know something about the conditions of the world, conditions which affect the fortunes of their own country and their lives; understanding humanity's dependence upon the natural world and developing a concern for the proper maintenance of 'global health'; understanding that the social, economic and political frameworks within which the individual lives, are shaped by decision-makers who have a variety of motives and differential access to power; achieving the mastery of some skills of graphicacy; and above all, learning how to learn for oneself.

In the second instance it does provide opportunity to apply a variety of geographical skills and critical thinking through fieldwork. Through direct experience pupils can acquire knowledge, skills, and ideas and test hypotheses in a local environment situation which enhances scope for self-education. In the third instance many geography topics confront the pupil with ethical, moral and philosophical questions which may be tackled from a wide range of alternative approaches and perspectives. Young people today demand more knowledge of facts so they can develop their own informed opinions and values. In the fourth instance school geography explores physical geography relating to the conditions for human survival on earth. An understanding of the dynamics of the earth's natural processes must precede any intervention and utilisation of natural resource systems for man's own benefit. Physical geography is therefore part of an education for life in a world which depends ultimately on the resources, processes and conditions of the natural world. In the fifth instance school geography can provide for more effective studies

regarding the impact of political and economic processes and activities on geographical patterns and changes to foster economic awareness and political understanding.

According to Van der Merwe, a new South Africa scenario with the inheritance of burdens from the apartheid-era, will present a number of new problems which geography is well equiped to deal with (Van der Merwe, 1990/91: 8 - 10). These issues and approaches reiterate the importance for school geography to provide and prepare pupils as future citizens with the required background, knowledge and skills to address these issues in seeking solutions. School geography also provides pupils with the opportunity to develop geographic skills of critical thinking of seeking solutions to current and future problems in the organisation of space. School geography can play a substantial role within political, social, ethical, personal, humanistic, aesthetic and environmental education (Commission on Geography Education, 1992: 12). It is evident that the criteria for judging what is worthwhile knowledge in schools has changed from that formally defined by an elitist subculture, to that more suited to an open, dynamic and technologically based society. It is a change from 'knowing that' to 'knowing how', from a concern with the cognitive repertoire of scholars to a practical concern with people's competencies manifest in ordinary life (Hall in Fien, 1989). The consideration of issues and attitudes and values as well as key concepts and of skills is essential if geography is to meet the needs of pupils as adolescents whose lives lie in the future and whose interest could only be addressed by an appeal to the world of feeling as well as the intellect (Hall in Walford, 1990).

To support the case for school geography, the geography curriculum for the 1990's requires a major transformation. A paradigm shift in the 1960's transformed geography from the idiographic description of regions, i.e. geography's traditional pre-occupation with the individuality and uniqueness of different countries and areas, to a nomothetic, law-seeking science, i.e. a geographical approach concerned with the explanation in terms of general theories (HoltJensen in Clark, 1989: 52). The 'new geography' found its way to school geography in South Africa in the syllabus revisions of the 1970's and 1980's emphasising a systematic approach at junior and senior secondary levels stressing conceptualization, i.e. to seek more generalised statements which link phenomena together. In this regard Graves writes 'It is necessary to accept that in structuring a syllabus one is essentially concerned with concepts and skill rather than facts. Facts are impermanent, they change rapidly, whereas concepts enable us to handle situations with greater ease, to classify order and relate what may otherwise prove chaotic' (Graves in Hall, 1976). However, during the revision of the 1985 core syllabus, no recognition was given to other paradigm shifts which were competing for supremacy especially in the human geography. Physical geography, according to Graves had accepted the physical science paradigm (Graves, 1984).

In human geography, since the 1970's and 1980's, the world was overtaken by environmental and Third World issues. The emergence of environmental studies and a geography of social concern have largely been neglected in school geography in South Africa in spite of valuable contributions by contemporary geographers involving socio-political issues doing research on social and environmental problems and development strategies in the 1980's (Nightingale, 1985: 89). Huckle describes the 1980's as the decade when the so-called 'adjectival educations' such as development education, environmental education, peace education, personal and social education and vocational and economic awareness all made significant progress as they

incorporated elements of critical theory and pedagogy and provided pointers for more progressive school geography to follow. The growth of critical theory provided a social education which facilitates critical and active citizenship (Huckle in Walford, 1991)· It is important to note that these issues embrace both physical and human dimensions of geography. Although it appears as if man is the focus of study, Woolridge's argument that geography includes place, is significant for physical features are just as important as non-physical features in shaping human activities. Since pupils grow up in a physical and cultural landscape, they are entitled to learn about both (Woolridge in Graves, 1884). However, the approach to physical geography in the present core syllabus requires serious consideration. Plump supports this view when stating that pupils are motivated by environmental issues and this is the direction physical geography ought to take, linking to some element of human geography to move to capture the imagination and motivation of pupils for understanding physical geography (Plumb in Walford, 1990). Gerrard reviews a number of new approaches to physical geography suggested by the Association of American Geographers which defines physical geography as a study of the workings of the environment at the interface at the bottom of the atmosphere. This focus gives emphasis to the role of location or place in the different accomplishments of environments and recognise that there may be different systems of interest in physical geography. Because the focus is on the interface it also includes the influence and role of people in a more meaningful way. The ecosystems approach also fits into the format but there are also other ways of focusing on the interface. The use of the interface makes it possible for a healthy physical geography to develop based on the achievement of three aims. Firstly it can lead to a clear unifying theme and methodology to provide a common focus or framework for displaying the integrity of questions and issues that concern it. Secondly it provides a functional relation with the rest of geography. Finally the requirement for a pedagogic approach that directs the learner towards new questions and fosters self-motivated learning through inquiry (Gerrard, 1988: 30, 31).

In the 1990 South African scenario there is renewed interest in ecology, ecological demands, environmental impacts, wise management of resources, concern with the quality of life, sustainable development, developmental strategies and a host of other issues related to human geography (Rogerson, 1992; Van der Merwe, 1990/91: 8 - 10). The International Charter on Geographical Education lists a large number of current issues and problems facing the world from a geographical point of view which may be on local, regional, national or global scales (Commission on Geography Education, 1992). Fien and Gerber's challenge to school geography, in particular to a 'new' South Africa, requires careful thought:

> "It is for all of these young people ... it is for them ... that we seek to create a vision of a better world through our teaching in order to bring about changes in outlook and action that ... (can be) described as ' true education '" (Fien and Gerber, 1988).

At the end of the 1980's labels such as Welfare, Behavioural, Phenomenological and Spatial seem to be of less significance in attempting to describe the contemporary profile of geography than appreciating that the activities of geographers are increasingly concerned with environmental appraisal, in the deployment of quantitative techniques and of systems analysis to yield data of value to policymakers in the

regulation and control of both the physical and social world. There is a shift from pure applied research from the acquisition of knowledge for contemplation to knowledge for action (Hall in Walford, 1990).

However, the success of school geography's response to the challenge will, in the final analysis be determined by the geography teacher's innovative teaching practices in the classroom as the nature of geography education is determined by the views and behaviour of teachers rather than the aims and objectives of the curriculum (Ballantyne, 1989/1990: 196).

In conclusion, the major challenge which requires response is postulated by Sir Keith Joseph (Joseph in Boardman, 1986: 11):

"Geographers themselves have to be clear about what their subject is uniquely or best qualified to offer, since it is on this basis that their subject's claim for scarce curricular time should be made and judged".

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THE GREAT MISINFORMATION MACHINE AND THE PROMULGATION OF NAÏVE SCHOOL GEOGRAPHY: IMPLICATIONS FOR CANADIAN SOVEREIGNTY

Paul F. Thomas

Abstract

This paper indicts the epidemic level of misinformation in the geography and social studies materials that impact upon Canadian high schools. Extensive documentation is provided for the prevalence of the problem, as its extent would not otherwise be credible to the academic community at large. Some structural reasons for its existence are indicated as well as implications for Canadian sovereignty and territorial order.

1. The Problem and its Ramifications

At the end of 1993, a certain television journalist reported that there were 112 wars, of various scales, raging in the world at that particular moment. A guest on his program wondered what new knowledge would be necessary to end these wars. Another rejoined that humankind has *possessed* for some time sufficient knowledge to alleviate most of the world's ills, but that the issue was largely one of *disseminating* and *applying* the best knowledge available, rather than waiting for more knowledge to be discovered. It is unfortunate therefore, that where Canadian school-geography and social studies are concerned, one can no longer be certain that basic undisputed facts are being transmitted without distortion. Without accurate diagnostic information, school-geography becomes irrelevant to comprehending the national and international situation, let alone ameliorating it. Nevertheless, within the last decade, misinformation and distortion in all too many current Canadian and American textbooks have reached such epidemic levels, as to engender disbelief on the part of professional geographers. Hence a large part of the present article must be given over to a documented sampling of the problem. Accuracy of information is not merely an "academic" matter. In the case of geography and social studies, accepted "facts" shape the attitudes of future citizens towards other peoples and places. For example, the gross inaccuracies indicated in Figure 1, were perceived by some Canadians, as akin to *misinformational imperialism*, potentially damaging to Canadian-American relations. As it happens, learning materials used in Canada - for the most part - are either imported from the USA, or published in Canada by American-owned firms. Where some provinces have, from time to time, insisted on locally produced materials for the schools, the ideas of their writers have tended to be coloured by those of competing American materials, be they textbooks, videos, or journals. Accordingly, most of the examples that follow will be necessarily American. But as will be seen, the problem is subtended by a deeper structural issue than that of mere nationality.

(MAP OF CANADA AND UPPER U.S.)

Above is a map of Canada. Fill in the regions, provinces, major cities, and major lakes and waterways of Canada and the border states (in the U.S.). You may use a textbook or an atlas to help you.

Also on your map, use the symbols below to show the terrain.

▲▲▲▲ = mountains
✳✳✳ = ice-covered areas
↓↓↓ = farmlands
+++ = tundras
↑↑↑↑ = forests

Source: true copy from:
Social Education 52(7), S8

Gross Errors in Geography Activity Sheet #1

✗Alaska panhandle is missing.

✗Vancouver Is. & Prince Edward Is. (a Canadian province) not shown.

✗Newfoundland and Cape Breton Is. should not be joined to the mainland.

✗Only four (of five) Great Lakes are shown.

✗Massachusetts and upper New York state are joined.

✗The USA border is not indicated.

✗"Upper U.S." is not a concept used by regional geographers.

✗Inappropriate map symbols are indicated for some of the tasks:

→ area of ice-cover is a function of season which is not specified.

→ "farmlands" are not differentiated; their depiction meaningless on small-scale map , since farms may exist in forest clearings.

✗For middle-school pupils to draw rivers on this type of map is "busy-work".

✗It is not clear as to what kind of "regions" are to be filled in - *physical? climatic? economic?*

Figure 1. Mangling of Canadian geography by "experts"

[sponsored by Donner Foundation, Encyclopaedia Britannica *et al*]

2. The Evidence

2.1. Personal experience

About eight years ago, I was asked to evaluate commissioned manuscripts for a geography textbook project initiated by a major commercial publisher. As the draft manuscripts came in, I learned a number of startling facts previously unknown to me. I learned that "the Rhine River flowed from the North Sea to the Alps", "the Urals received less precipitation than the English Lake district because of a cold ocean current off the coast of Spain", and that "all Slavs were Russians". In response to my attempts to correct such errors (which occasionally ran at 10 per page), the company president who had established a reputation by publishing fiction, cautioned me against "cramping" anyone's creativity, adding that "one person's opinion was as good as another's" (in the matter of geographic facts), and "besides, changes were costly, the project was over-budget and deadlines had to be met". I eventually resigned from my highly paid role. The published products were several times rejected by provincial teacher-evaluation committees, but finally revised into acceptance at very great financial loss, the president being forced to sell the company.

2.2 The critical experience of others

For a time I felt that this bizarre situation, incredible though it seemed, was singularly unique. But it was not. Nor are all textbook-evaluation committees equally discerning. Richard Feynman, a Nobel-prize physicist relates (1985) that whilst involved with a mathematics-textbook approval process in California, three competing textbooks had been submitted in the hopes of obtaining official state endorsement. Two of the books were real, but the third was a "dummy" consisting of blank pages, sandwiched between real covers. As it turned out the dummy book received the highest approval ratings in the textbook evaluation process.

2.2.a. The geography and social studies situation

In April 1991, an expert panel of textbook reviewers commissioned by the state of Texas on the verge of approving 10 social studies textbooks already widely used through the USA and parts of Canada, were challenged by an advocacy group who had detected some 231 instances of egregious misinformation. Some of these are shown in Exhibit A. (It should be borne in mind that in a number of American and Canadian jurisdictions, *geography* topics have sometimes been taught under the rubric of *world history*.) Upon revisiting the review process with outside experts, 5200 errors were reported for these same books. Thereupon the state authorities exercised a contractual right, hitherto rarely exercised, of levying fines projected at $547,000. (Wall Street Journal, 1992, B1).

That blue-ribbon panels are not always to be trusted in either the production or evaluation of geography materials is evident from Fig. 1, which was presumably authorized by Encyclopaedia Britannica(!) (See Corporation for Public Broadcasting, 1988.)

2.3. Generalizability

How prevalent is such bungling in the production of informational resources? Is it uncommon or is it structurally systemic? In 1985, a group of Californian educators, with a view to preventing a recurrence of the fiasco reported by Feynman (1985), formed the nucleus of the *California Textbook League*. By 1989, this same group had

Some Egregious Errors in Current Geography/Socials Textbooks

❖ = Textbooks censured in *Wall Street Journal* (1992, B1)

❖ President Truman settled the war in Korea by dropping a nuclear bomb. [No nuclear weapons used; Eisenhower was president at the armistice.]

❖ Napoleon won the battle of Waterloo.

❖ Sputnik was a Soviet missile carrying a nuclear weapon.

❖ Churchill delayed in sending troops to Stalingrad.

❖ American troops encountered stiff resistance during invasion of Cuba.

▫ = Wiley: *Travel & Tourism - A World Regional Geography*, 1992

▫ A text on the 11 "world regions" uses country-names for 6 of them, which are distinguished by calling Japan a *political* region, Thailand a *cultural* region, Peru a *historical cultural* region and Netherlands a *demographic* region. [The descriptors are not regionally distinctive and could be applied to most countries.]

▫ "The world in 1992 had three hemispheres - the Chinese, the Russian and the American". The book's cover shows the Pacific Rim. The book's contents however, make no reference to China or Russia whatsoever.

◆ A book's only chapter on Canada opens by listing seven representational *keys to understanding*. Six of these are not particularly representative of Canada as a whole [*iceberg, parka, igloo, Inuit, asbestos* and *caribou*]. [McGraw Hill: 1989]

▷ Many of Canada's physical regions "extend from United States regions" (especially the Canadian Shield which is 99% Canadian).

▷ A full 2-page "journal spread" is given for the *Geography of the Black Death* of 1348-1350. But there are only three sentences in the whole book on World War II!! The Vietnam war obtains two sentences! [▷ = Harcourt, Brace: 1989]

□ A 900-page world geography text, extolling "use of maps to understand military history", devotes one column inch to World War II and gives no data re who the belligerents were or what the issues were about. [Scott, Foresman: 1989]

◉ A textbook devoting 70 pages to the [former] Soviet Union that provided (erroneous) maps of pre-Russian church history, fails to acknowledge in the text, or show on maps, that the USSR had any constituent republics [Glencoe, 1989].

★ Most North American world-geography textbooks continue to make serious errors concerning Russian historical geography [including Glencoe: 1994]. [For detailed amplification of this point see Thomas, 1994.]

Table 1. SAMPLING OF DESCRIPTOR SUBTITLES FOR SCHOOL GEOGRAPHY BOOK-REVIEWS APPEARING IN *THE TEXTBOOK LETTER*, 1990-1993*

Verbatim Subtitle of Book Review	Reference: [Vol. (No.) pp.]
"A Glitzy, Mindless Book That Glorifies Ignorance"	3(6), 3
"How Exxon's 'Video for Students' Deals in Distortions"	3(6), 8-9
"I Weep for the Students"	3(6), 10-12
"Much That is Commendable, Too Much That is Sanitized"	3(4), 6-7
"Ignorance and Incompetence Wrapped in Colorful Covers"	3(4), 8-9
"An Obsolete Collection of Myths and Mistakes"	1(4), 6-7
"An Inconsistent Text, Not Recommended"	2(6), 7-8
"A Silly Textbook by Writers Who Do Not Know [Earth] Science"	2(6), 8-9
"Fake 'History' That Is Flatly Wrong" [earth-science]	2(6), 9
"A Shoddy, Fatuous Book That Mangles Its Subject'	2(3), 4-5
"Nonsensical Content, Incompetent Writing"	2(2), 5
"A Textbook That Is Careless, Confused and Unacceptable"	2(2), 4-5
"A Hasty, Superficial Product, Often Careless and Confused"	4(3), 2-3
"This 'Revised' Edition' Is Poor and Obsolete"	4(3), 12
"A False, Shabby Book That Must Be Rejected"	3(2), 9-10
"Reducing World Geography to a Huge Vocabulary Drill"	1(4), 11-12
"A Weak Book That Tells Little About Geography"	1(4), 12

* Notes: As the intent is to document a generic problem, and not to.embarrass specific publishers, book titles and publishers are not given in this table. The reference-column documents the actual existence of the critical subtitles. Sampling issues are discussed in the body of this article.

Some Structural Factors that trivialize geography materials:

The Writing Process
- Anyone can write about *geography* because of lay-perceptions that its subject-matter is trivial.
- Writers' contracts usually stipulate that final editorial control rests with publishers; so writers may not see and approve drafts to be reviewed.
- Senior scholars may lend their names to a textbook (prestige-marketing) but may delegate details of writing to graduate students untrained in sound pedagogy.
- Curriculum guidelines for which books are written may themselves be naive.
- Writing to readability formulas may take precedence over explication of critical knowledge.

Political Sociology of Committee Selection and Behaviour
- Persistence of bureaucratic rituals more appropriate to 1900 AD.
- Membership on textbook-adoption committees based on political criteria, regional representation or role, rather than subject-expertise.
- Committees often more concerned with procedural than substantive criteria.
- Senior scholars tend not to get involved in the nitty-gritty of textbook approval as such is regarded as a low-prestige activity.
- Statistically valid surveys of ignorant opinions does not yield truth.

Tensions: Economic, Ideological and Psychological(q.v.)
- Residual content that survives these tensions is apt to be sanitized and vapid. **Structural Paradox:** Geography is most useful when it has policy implications; but policy implications are often controversial and may therefore not be discussed, thus depotentiating the critical knowledge that geography has to offer.

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inaugurated *The Textbook Letter* (q.v.), the first American publication to independently and critically assess textbooks that might seek endorsement *in any state*. This publication does not accept advertising - so as to avoid possible conflicts of interest. In some respects, it is perhaps comparable to Phil Edmonston's dispassionately documented, *Lemon Aid Guides* to automobiles (1994). The *Letter* maintains no regular staff, but recruits reviewers as needed, and by the scores, across all subject areas. These reviewers are required to be acknowledged, academic authorities in their respective fields.

The *Textbook Letter* has over the past several years, commissioned reviews of the leading contemporary school textbooks of interest to geography-educators. A perusal of about 50% of the reviewed titles for school books in world geography and certain cognate disciplines (earth science, ecology, world history) led to the creation of TABLE 1. This table lists the summative subtitles attached to various book reviews and indicates where the full review can be found. [A full title might be along the lines of "Pomeroy & Jones, World Geography 93: A Compelling and Futuristic View of Global Order that Could Stand More Historical Precision", the underlined stem corresponding to the critical or summative subtitle.] The sampling may seem biased towards severely critical descriptors. But most of the books did not meet the threshold standards for scholarship that could be, in all conscience, be passed on to school teachers and then retransmitted to high-school pupils at the grades 9 to 12 levels.

Reviewers for the *Textbook Letter* are by no means possessed of a genetically endowed, negative disposition. They have been quite capable of writing positive descriptors when justified by the quality of a product. Such positive reviews made up about 30% of all reviews across all subjects. Examples include: "This solid, Attractive book Focuses on Political Events" [4(2), 10], "One of the Best Textbooks for Global-Survey Courses" [3(3), 12], "An Admirable Job by People who Don't Fear Controversy" [3(2), 7]. In the main, however, 80% of the textbooks specifically designated as geography, had rather serious deficiencies. The critical summative subtitles attempted to encapsulate a universe of concerns ranging from distortion and misinformation, trivialization or denigration of the proper mission of the discipline, non-coverage of critical content-matters, to the sanitization of true but unpopular facts of historical/political geography. To detail the higher-order concerns that flow from misinformation alone, would require several volumes. In any case the problem with North American geography textbooks is not a sporadic one. It is quite systemic and structurally so.

3. Reasons for the Problem

3.1 General

The process of school textbook production is "so maddeningly complex that even full-time students of the process have difficulty tracking the labyrinth of cause-and-effect relationships" (Tyson-Bernstein, 1986, 41). As evident from the text box below, *Some Structural Factors* ..., the actual authors of a book may be the least responsible for its ultimate merits and disposition. They may even be embarrassed at the discongruity between their original submission and the final product.

3.2 Structural Tensions.

3.2.a. The profit motive.

Although governmental involvement is necessary to ensure fair access to education and educational materials, publishers' quasi-monopolies emerge with a potential for corruption and inefficiency. [Feynman (1985) reports how, as a member of a state textbook-approval committee, he was showered with gifts by publishers intent upon obtaining special consideration.] This leads to a tension between *truth* and *profit*. Profit is best served by pleasing bureaucrats and by offending as few vocal pressure groups as possible. Most textbooks emulate the market leader. To be different is dangerous (Paul, 1988, 32).

3.2.b.
Realism versus idealism.

A fundamental ideological tension exists among educators between *realists*, i.e., persons who wish to describe the world as it actually is, and *idealists* - those persons who wish to describe the world as they would like it be. This tension can have many variations. One is that between *objective truth* and *political truth*. Legitimate *human-rights* issues sometimes translate into "political correctness", which in turn can lead to *textbook sanitization*. A curricular goal of portraying all cultures positively, may result in the suppression of negative facts about other countries. For example, the Ukrainian genocide-famine of 1932-33 could not be mentioned in Canadian textbooks for fear of not portraying the Soviet Union in a positive light, [and also because Canadian wheat shipments to the former USSR could have been affected (see Thomas, 1994)]. In other instances, successful lobbying by a vocal pressure group may result in the overemphasis of some textbook issues, and the skirting of others, as happens when fundamentalist religious groups condemn and boycott "pacifistic", global-educational materials detailing non-violent strategies for conflict resolution (Caporaso, 1988, 37). Sometimes *idealism* is retrospective in order to sanctify a historical revisionist agenda, as in the case of the Japanese government's recent declaration that a number of objectively documented events - pertaining to Japanese military aggression in World War II - could not have occurred, on the grounds that "they are disrespectful to the Emperor" (Greenfeld, 1993).

3.2.c. Role of psychological typology.

Ideological tensions, including *style-versus-content* preferences, may have an underlying psychological basis. According to Kiersey (1984), 50 percent of the American populace at large are innately *feeling* types. In Jungian psychology, *feeling* is a precise technical term signifying a psychological *rapport* function more concerned with *tact* and "getting on", than with objective truth. Persons most likely to be concerned with objective truth, i.e., Jung's *intuitive thinking/judging* types make up only 6 percent of the general population and a lower percentage still, of school personnel. (See Kiersey, 1984, *passim*.)

4. Uncertain Outlook for Canada

4.1. Lack of national purpose militates against both quality of school geography and its economic / cultural / political relevancy

Some of the unarticulated rationale for the well-documented *feeling-good* movement in North American education [which has been implicitly derided by Neil Postman,

1985] may have a psycho-political basis. One-third of school students, but only 2 percent of school teachers in North America are innately *sensing-perceiving, concrete-thinking* types [SP typology], possessing aptitudes and interests that are not really met by the public schools as presently constituted (Kiersey 1985, 155). It is the attempt to keep these students in schools, so as to reduce very high drop-out rates [sometimes in the order of 40% before high school graduation (see Valpy, 1993)] that has inspired the recent watering down of provincial educational curricula in Ontario and British Columbia. The intent has been to have cognitive-domain tools serve affective-domain needs. In point of fact, SP students might be better served by vocational, technical and technological training-schools at the secondary and post-secondary levels. And so would the Canadian economy, as Canadian education does not seem to yield a reasonable return on its annual $50 billion cost - a sum that would pay off the national debt (Wilson, 1994). At 2 percent, the Canadian level of participation in non-academic, vocational education at the upper secondary-school level, is the lowest among so-called advanced nations. [Germany's participation rate is 80 percent, according to 1991 statistics produced by the Canadian Labour Market and Productivity Centre.] The resultant dearth of trained workers capable of making substantial contributions to *basic industrial* output reflects a popular prejudice that only academic education has any value. As a result, many universities are overcrowded with persons intent upon obtaining diplomas, irrelevant to the job market in a changing world that demands ever higher levels of technological expertise. At the same time, the mass culture of consumerism that permeates the Canadian universities, has displaced rigorous inquiry, so that the problems of watered-down information have become intensified within the very former bastions of critical knowledge.

4.2. Loss of economic, cultural and political sovereignty
Given the absence of a federal presence in Canadian education, and the concomitant balkanization of educational authority with its affective-domain concerns, a vicious circle develops. Thereby a continual erosion of meaningful school- geography precludes the levels of public geocultural literacy pertaining to Canada and the rest of the world, that are necessary to achieve and maintain national identity, national unity and national survival. According to Ralph Nader [in giving a public address in Victoria, B.C., February 1993], such illiteracy, i.e., *inadequate intellectual occupance of the national territory,* suits the agendas of certain multinational corporations who stand to increase their corporate profits from the breakup of Canada and its social-security system. The emergence of electronic superhighways poses special dangers in that regard. The corporate culture of conglomerates and merger-acquisition results in the monopolization and control of informational resources. As for the quality of such informational resources, "who will be minding the store?". Will the electronic versions of *Time* magazine and the highly pictorial, but uncritical *National Geographic,* then drive the national, and even international, geography / social-studies curricula? As members of the Frankfurt School of Sociology might say: "With capitalism, what can one expect?". Ivan Illich would say: "the electronic pedagogization of life will become the new myth of education" (Cayley, 1992).

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GREENING THE KHAKI: INFILTRATING ENVIRONMENTAL EDUCATION INTO A MID - CAREER PROFESSIONAL DEGREE FOR AUSTRALIEN ARMY OFFICERS

Brian Maye

Abstract

This paper refers to the call by the International Geographical Union and others for widespread interdisciplinary environmental education at all levels and makes a case for its wider inclusion in undergraduate professional degrees. It notes continued growth in specialist environmental courses, and advocates wider provision of interdisciplinary environmental education within existing undergraduate degrees for non-environmental specialist professionals. Successful incorporation of an environmental education strand into a mid-career professional undergraduate degree provided by distance education for Australian Army officers is outlined. Those undertaking the strand have indicated that it has been effective in providing for increased awareness of environmental issues and development of knowledge and skills needed to address them.

Introduction

"The more knowledge available in the hands of educated people capable of understanding the information the greater the chances are of significantly reducing environmental damage and preventing future problems. ..."

This statement by the Preparatory Committee for the U.N. Conference on Environment and Development, quoted in the International Charter on Geographical Education (International Geographic Union, 1992, 9), suggests the need to incorporate environmental education as widely as possible into formal and public education programs in order to contribute to the development of a citizenry which is aware, informed and capable of acting directly and indirectly to overcome or reduce environmental problems and issues.

If universities are to contribute more comprehensively and effectively to this process, opportunities for environmental education will need to be made more widely available at undergraduate level, and the kinds of approaches used will need to change. The role of the social sciences in understanding environmental issues and in contributing to their resolution needs to be more fully pursued, and the essential interrelatedness of complex ecological and social influences operating in any environmental issue needs to be acknowledged by the adoption of interdisciplinary approaches.

The tendency for environmental education at university level to be concentrated in specialist awards reduces the possibility that the purposes often advocated for it will be achieved on a widespread basis. What is needed to contribute to the kind of attitude shift implied by the statement above is wider incorporation of interdisciplinary environmental education into non-environmental specialist undergraduate university awards. In this way it will have a direct impact on those entering a range of professions not necessarily thought of as environmentally related, and ultimately can be expected to have a wider influence through the professional and personal activities they become involved in.

A profession which does not spring to mind readily in terms of environmental sensitivity is the military, some of whose members in Australia have been heard literally to refer to species of eucalyptus trees over a certain diameter as "50 calibre trees". However, it is an organisation whose officer corps is responsible for providing leadership which impinges in a variety of ways upon the attitudes and activities of significant numbers of people, including their use and management of vast tracts of land and diverse environments. The provision of appropriate environmental education for such a group therefore has the potential to contribute to achieving the kinds of aims inherent in the International Charter on Geographical Education (International Geographic Union, 1992).

This paper outlines the inclusion of an interdisciplinary environmental education strand within a mid-career professional studies degree undertaken through distance education by Australian Army officers. Experience to date indicates that the courses involved have been well received and have the potential to exert a positive influence beyond the immediate military careers of the officers who have undertaken them.

Environmental Education in Universities

There is no doubt that the availability of environmental education in the specialist sense has increased rapidly in universities in recent years and continues to do so. A recent UNEP publication (United Nations Environment Programme, 1993, 15) lists an array of short course and degree programs currently being introduced into universities in Australia, New Zealand, Hong Kong and the United Kingdom. All are specialist professional awards with a focus on environmental science and environmental management, for example a M.Sc. (Environmental Management) at the University of Hong Kong, a sustainable development option in a M.Sc. (Agriculture) at the University of New England, Australia, and M.Sc. and Diploma courses in tropical coastal management at the University of Newcastle on Tyne in the United Kingdom.

Thomas (1993) produced a report on the nature and extent of tertiary environmental courses in Australia at the end of 1992, based on sixty five questionnaires returned from twenty seven of forty six institutions surveyed. He found that while a higher proportion of graduate courses tended to be interdisciplinary, transdisciplinary or multidisciplinary, the majority of undergraduate courses were specialised in the fields of environmental management, environmental studies, environmental sciences or science. Only one was in environmental education, and two had a social science focus (Thomas, 1993, 138). A similar emphasis on courses to produce environmental specialists appears to be evident in European countries, with Germany providing an example of a nation in which sixty-seven universities offer one hundred and eleven courses of study in specialised ecological training. Eighty-five of these lead to professional qualifications, mainly in the natural and engineering sciences, while the

remainder are continuation or supplementary courses in areas such as agricultural science, forestry, economics or law (Anonymous, 1993, 12).

Non-specialist interdisciplinary approaches to environmental education, with the broader purpose of citizenship education, are commonly advocated and practised in schools (Fien, 1991, 15). Ramsay and Hungerford (1989, 34) have reported that "... citizen participation in environmental issue remediation" is made more likely by the inclusion of education about environmental issues and "... action training" in the curriculum. Souchon (1991, 286) claims that "... environmental education is a true education in citizenship and the rational management of resources", while Huckle (1986, 16) advocates study of environmental issues as a means of enabling students to become aware of the role of national and international political and economic power in relation to environmental problems. Gigliotti (1990, 12), maintains that to date environmental education has not been successful in producing "... a citizenry that is able and willing to solve today's environmental problems" and that it "... must become a focal point of the entire educational system, from elementary through higher education". Clearly if such a goal is to be achieved in tertiary education, opportunities for environmental education will need to be provided more widely in non-specialist as well as in specialist degrees.

The recognition that interdisciplinary approaches are essential is becoming more widespread, but an element of frustration appears in the writings of authors on the subject, who appear to hold the opinion that not enough progress is being made in addressing environmental problems and issues where universities rely on traditional approaches grounded in discipline based specialist courses.

Disinger sees the interest of social scientists in environmental education related to sustainable development as positive, but concludes that until ways are found to overcome "... the twin hurdles of resistance to interdisciplinarity and lack of acknowledged priority, education about sustainable development will, at best, be spotty." (Disinger, 1990, 6). Dr Norbert Lammert, Parliamentary Undersecretary at the Federal Ministry of Education and Science, when addressing the German Bundestag on environmental training, spoke of the urgency of providing widely available environmental education which was essentially interdisciplinary in character. He maintained that "... a comprehensive, subject- and problem-overlapping education policy" was needed to "... help learners to grasp the difficult correlations between economic, ecological, technical, social and cultural questions and to translate them into action in the home, job and spare time." (Anonymous, 1993, 12).

Von Weizsäcker also states a powerful case supporting the necessity for interdisciplinary approaches in environmental education, and is highly critical of the tendency for universities to resist their adoption. "Interdisciplinary work should be rewarded and not, as has been the case so far, virtually punished with impediments to career." (von Weizsäcker, 1993, 16). Also referring to the German situation, Eulefeld acknowledged the role played by teacher education institutions and universities in raising environmental awareness, but noted that teacher education institutions in particular had "... as yet made little progress in moving teacher training away from conveying knowledge of certain processes towards the planning and implementation of activity based and interdisciplinary environmental teaching." (Eulefeld, 1991, 302).

There is evidence of growing interest in environmental matters in fields of professional education which traditionally have not included environmental education within their scope. For example, Shetzer, Stackman and Moore (1991, 20) report

research into environmental attitudes among business students in the United States which indicates the likelihood that they will contribute in the future to shaping more positive environmental policies among business organisations. It is suggested that a desirable path to follow in fostering acceptance of the importance and legitimacy of environmental education for such groups is to provide access to appropriate units of study within existing degree patterns. This approach was followed in providing an interdisciplinary environmental education strand within the elective structure the Bachelor of Professional Studies at the University of New England in Armidale, Australia.

The Bachelor of Professional Studies Degree

The Bachelor of Professional Studies degree is designed as an undergraduate degree for professionals who are working in careers based mainly in management and administration. It aims to broaden understanding of the context within which such careers are situated, so that it provides a set of study options which examine elements such as societal structures and processes, cultural understanding, and environmental interaction, as well as providing for further specialised study in areas related to the careers of clients enrolled in the degree. The degree was introduced in 1990 through a contract arrangement with the Education Corps of the Australian Army, which insisted that it be open to enrolment by students from other professional backgrounds, although most students undertaking the degree to this point have been Army officers from the ranks of lieutenant through to lieutenant colonel enrolled through the Junior Officers Professional Education Scheme.

Courses undertaken in the degree are selected from three groups, with students undertaking two major sequences. One major sequence must be from the group of courses which provides a foundation for the degree, normally involving interdisciplinary study of five or six semester-length courses on contemporary Australian systems, values, institutions and issues. It is within this group that the two elective subjects which make up the environmental education strand are situated. Other electives cover cultural, social and political aspects of Australian life, including Australian society in a world context. Army officers with relevant tertiary study undertaken at officer training school are normally given up to fifty percent credit upon entering the degree, but are required to undertake half of their remaining courses from this foundation group.

A second major sequence is required to be taken from one of the remaining two groups. Courses in the second group are also interdisciplinary, but are career related and cover aspects such as organisational structure and behaviour, leadership and staff development. The third group enables students to select from a range of courses which may be either career related or provide for further specialised study in an area of interest. This group includes courses in Asian languages and societies, Australian Aboriginal society, and courses in military history and economic history.

Delivery of the degree is by distance education, with participating students located in all parts of Australia, some more than 3,000 km from the University in Armidale. Although they are in scattered locations they receive the kind of consistent quality in education referred to by Daniel (1991, 39) through the provision of written course materials and the maintainence of two way communication essential to distance education (Holmberg, 1989,12). University staff have maintained communication with students by a variety of means, including lecture tours to bases where they are

located, interactive video conferences, and electronic communication such as telephone, fax and e-mail. Effective communication and implementation of courses has also been assisted by Australian Army Education Corps personnel, who have coordinated administration of the degree and provided local tutors to assist students.

The environmental education strand in the degree comprises a first level course entitled "The Changing Australian Environment" and a second level course called "Environmental Issues in Australian Society". The first level course focuses on the evolution and nature of the Australian environment, and aims to provide a base level understanding of biophysical elements of the environment and ways in which these are impacted by human use. Content covered includes physical and biological features of Australia, ecological significance of Australian flora and fauna, the impact of both Aboriginal and European occupance, the influence of technological change on the Australian environment, and the interconnectedness of local, national and global environments.

The second level course focuses on environmental issues within Australia and examines the complex of interacting human factors which are involved where conflict and differences of opinion arise in relation to the use and management of particular environments or resources obtained from the environment. Aspects covered by the course include the interrelationship of elements involved in environmental issues, the nature of environments, cultural definition of resources, the significance of perceptions, attitudes and values, as well as social, political and economic influences on environmental issues. The role of institutional and legal elements, such as bureaucratic structures and processes and environmental impact assessment legislation, is also included.

Both courses include assignments which require synthesis of theoretical aspects, but emphasis in assigned work is on applied approaches. In the first level course students are required to undertake a major field work based project which involves examining the biophysical environment in a selected area and assessing the nature and reasons for changes observed. In the second level course students are required to undertake a major project which analyses a local environmental issue. In undertaking this project a range of data gathering techniques is used, the nature and interaction of elements involved in the issue is identified, and an evaluation is made of the relative influence of major factors contributing to the differences evident in the issue.

The maintenance in both courses of an emphasis on interdisciplinary 'process' approaches to learning has provided the flexibility to enable students to become familiar with important aspects of environmental education in an applied way. This has meant that the location of students across Australia has proved to be an advantage in relation to the environments and environmental issues examined in the major projects undertaken. A great variety of biophysical environments, ranging from temperate to tropical, humid to arid and remote rural to intensively urbanised have been examined by students undertaking the first level course. A similar range of environments has been involved in the issues analysed by students undertaking the second level course. Issues examined have included some in which the Australian Army has been directly involved, such as the management of savannah areas in the Northern Territory for armoured exercises and the alienation of coastal areas in South Australia to extend an artillery testing range. The majority of those examined, however, have been of concern to the general community, and have included issues such as management of alpine national parks in Victoria, development of tourist resorts and mining of sensitive coastal areas in Queensland, the development of urban

freeways in Melbourne, and waste management and harbour oil pollution strategies in Sydney.

Survey of Students

At the end of 1992 a survey was undertaken of students who had completed the second level course in the past two years. Questionnaires were returned by 30 of the 52 students surveyed, with the latter number representing 25 per cent of students enrolled in the degree during the two year period. A background profile of these students revealed that 76 per cent were male, 86 per cent were at the rank of captain or major, 50 per cent had been an army officer for more than ten years, and none had undertaken any previous environmental education while in the army. Before entering the army 20 per cent had undertaken study which had some environmental content, most commonly in geography. These students were among the 30 per cent who held at least one university qualification on recruitment, and worked mainly in the Army Education Corps. The remainder were engaged in a wide range of duties including operations, planning, logistics, communications and administration. Only 6 per cent chose the environmental education strand in the degree because they saw it as related to their current duties, 60 per cent chose it because of personal interest in environmental matters.

A major purpose of the survey was to gain a measure of the extent to which students enrolled in the environmental education strand perceived it to be effective in (i) providing for increased awareness of environments and environmental issues and (ii) assisting development of a range of skills which are fundamental to environmental education. While the first level course took a systematic approach to the study of Australian environments, the second level course took an issues-based approach (International Geographical Union, 1992, 11) and very definitely set out to emphasise skill development as well as knowledge about the interaction of human and environmental systems, both seen as essential to enhancing ability to analyse environmental issues and to synthesise the results of such analysis. For this reason a particular form of presentation of the major field work based project was set to require students to use visual, diagrammatic and graphic techniques to identify, analyse and illustrate relationships between factors involved in the environmental issue they had individually undertaken to study.

Students were first asked to rate the effectiveness of the courses in increasing awareness of a range of knowledge aspects related to environments and environmental issues. Those rated in relation to the first level course included biophysical features of Australia, ecological significance of Australian flora and fauna, impact of Aboriginal and European occupance, the influence of technological change on the Australian environment, and the interconnectedness of local, national and global environments. In excess of 85 per cent of students rated the perceived effectiveness of the course 'high' in relation to increasing awareness of all factors except for the impact of Aboriginal occupance, which 48 per cent of students rated as 'high'. This might be explained by the relatively brief treatment in the course of a subject generally known to be quite complex in nature.

Aspects of knowledge covered in the second level course are indicated in Figure 1. The lowest frequency of ratings in the 'high' range, representing 79 per cent of all students, relates to administrative and legal aspects of environmental issues, while over 85 per cent of students rated six of the eight knowledge aspects 'high' in relation to the effectiveness with which they increased awareness of environments and environmental issues.
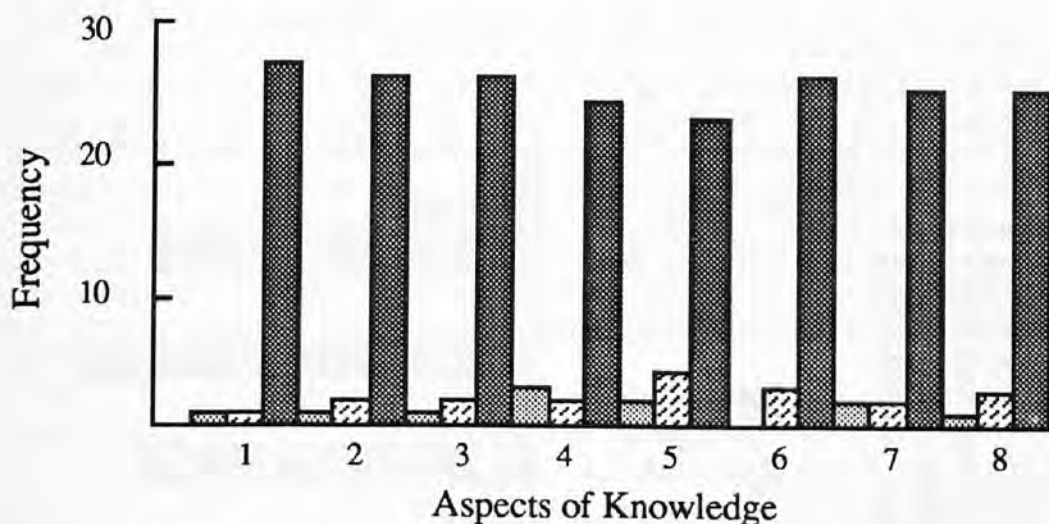
Figure 1. Student Ratings of Effectiveness in Increasing Awareness of Knowledge Aspects

Low   Neutral   High

Aspects of Knowledge

1. Range of influences
2. Interconnectedness of elements
3. Social aspects
4. Political aspects

5. Administrative and legal aspects
6. Economic aspects
7. Perceptions, attitiudes and values
8. Rights and responsibilities

As a major purpose of the courses was to enable development of skills generally seen as essential to effective environmental education, students were also asked to rate the extent to which the development of a range of skills was assisted by their experience in participating in the courses. The skills whose development they were asked to rate were derived directly from those contained in the International Charter on Geographical Education (International Geographical Union, 1992, 7 - 8).

Figure 2 lists the skills which were rated and shows the frequency of ratings placed on the effectiveness with which they were perceived to have been developed. Over 75 per cent of students rated the majority of skills 'high' in relation to the effectiveness with which the courses had contributed to their development. The lowest proportion of 'high' ratings, 33 per cent, related to "working cooperatively in team situations" is not surprising, given that the courses are undertaken externally and therefore are likely to be completed in many cases by students working in individual situations. An interesting comment appended by a small number of students was that they had rated the contribution of the courses to the development of the range of skills measured as 'low' because they has already developed such skills as part of their profession. These students worked in military intelligence and planning at Defence Force Headquarters.
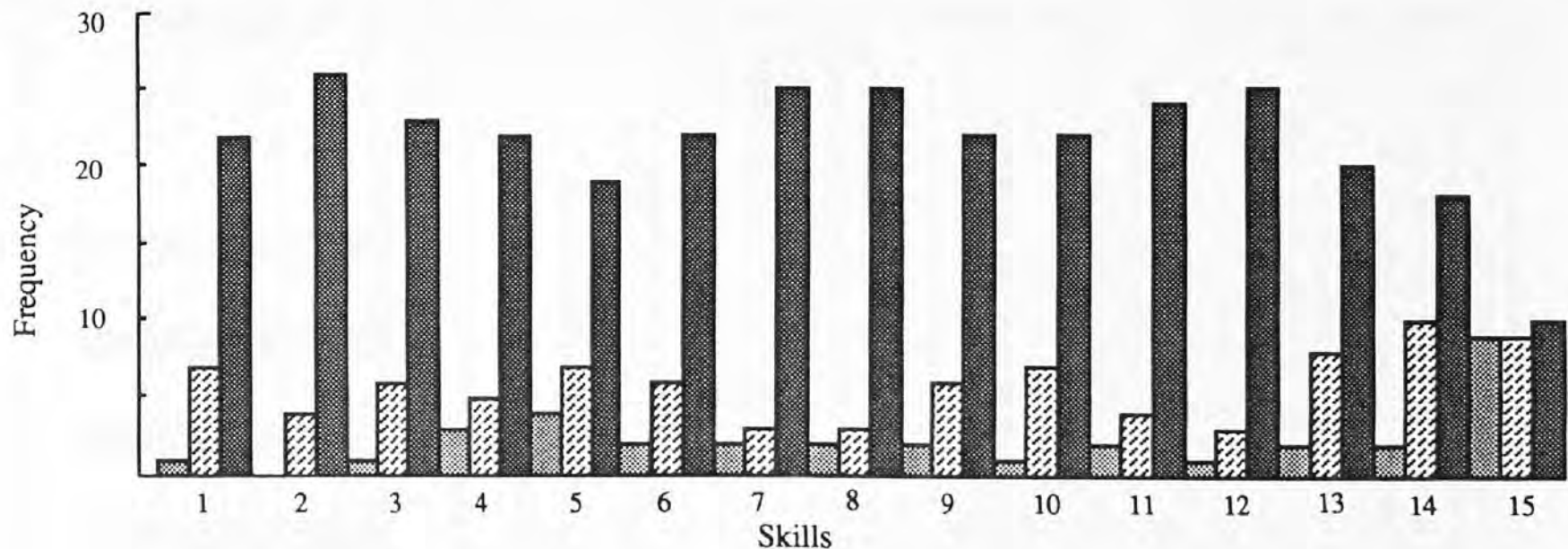
Figure 2.   Student Ratings of Effectiveness of Skill Development

▨ Low   ▨ Neutral   ■ High

<u>Skills</u>:

1. Gathering and interpreting primary data
2. Interpreting secondary data
3. Using quantitative and symbolic data
4. Using social skills to gather information
5. Using verbal communication skills
6. Using written communication skills
7. Identifying questions and issues

8. Collecting and structuring information
9. Interpreting and analysing information
10. Evaluating accuracy and relevance of information
11. Developing conclusions and explanations
12. Making judgements
13. Making decisions
14. Solving problems
15. Working cooperatively in team situations

Students were also asked to indicate whether knowledge and skills developed in the course were useful in their current duties, and whether they anticipated they would be useful in the future. 30 per cent thought that knowledge gained was likely to be useful in their current duties, and 50 per cent thought that skills developed would be. A number of students commented on how interesting they had found the content, many commented that they had improved their analytical abilities, a small number commented that they had ILS: FIGURE 2 (SEPARATE PAGE)extended their knowledge of environmental issues more than they had anticipated, and several commented that the courses had contributed to their ability to manage land resources they were responsible for and would enhance their ability to negotiate with others who were involved in this process.

Over 93 per cent considered that knowledge and skills gained through the environmental education strand would be useful to them in the future. While only 10 per cent thought that they would be relevant to advancement in their army career, 27 per cent thought that they would be relevant to a post - army career and 13 per cent thought that they provided a basis for further study. 33 per cent saw the development of their personal interest and increased knowledge of environments and environmental issues as being useful for the future, and 6 per cent said that their ability to influence others on environmental matters had been improved.

Conclusion

The overall impression gained is that the environmental education strand in the Bachelor of Professional Studies has been successful in achieving its major goal of providing for increased awareness of environmental issues and development of knowledge and skills needed to address them, certainly at a personal level and potentially at a professional level in a significant number of cases. Providing access to this kind of interdisciplinary non-specialist environmental education is very much in accord with the views expressed in the International Charter on Geographical Education (International Geographic Union, 1992), quoted at the beginning of this paper, and is seen as necessary to the development of an informed citizenry which is impelled and empowered to act on matters of environmental concern.

While the literature indicates continued growth in the university sector of provision for education of environmental professionals, it also reveals an urgent need for integrated, interdisciplinary approaches to environmental education to more effectively address environmental problems and issues. There is evidence of sensitivity to and interest in environmental issues among students enrolling for professionally related degrees, so that adequate provision of appropriate courses has the potential to widen access to environmental education if it is seen as part of existing awards and not necessarily requiring the introduction of new degrees. Experience with the Bachelor of Professional Studies at the University of New England, Australia, indicates that this approach can contribute successfully to non-environmental specialist professional education, with the added bonus of widening access nationally and providing for lifelong education where environmental education is provided through distance education techniques to practising professionals.

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PERCEPTUAL DIFFERENCES OF GEOGRAPHICAL CONCEPTS
BY SCHOOL CHILDREN

Norman C. Tait

Abstract

The dicipline Geography is usually introduced at school level when the pupil is 9 - 10 years old. The problem is **what** to introduce and **which approach** to follow. Information regarding the pupil's spatial conceptualization may help to develop a meaningful curriculum. Mental maps at different scales (house, school, village) was used in a primary school for black children to try and understand something of their spatial conceptualizations. Aspects that received special attention was **phenomena, size, relative size, scale, location, relative location** and **orientation**. Although undefined, the pupil's natural optitude for these concepts (within a resolution or regional framework) could provide the basis for their further geographic development.

Introduction

In South Africa Geography is introduced into schools at standard 2 level when the pupil is more or less 9 - 10 years old. A maj or problem is **what** to introduce at this stage and **which approach** to follow. The first question therefore is: What can the pupil conceptualise at the beginning of his/her fourth year in school?

Secondly: Do we start with the known and proceed to the unknown or with the home region and then seek wider perspective, is the focus on ecology or problem solving? There are several options regarding an approach.

Main text

1. Background

The draft of The *National Geography Standards Project* in the USA obviously contain a big variety of concepts with which the pupils should be familiár. As a member of the International Committee, I became particularly interested in concepts used in the Grade 4 (10 years olds) performance standards. Selected examples include the following:

elevation
population density
direction
scale
contour
biomes
distance on map
hypothesis
renewable resource
hemisphere

I personally believe that the average 10 year old pupil do not understand most of these concepts. Therefore I decided to carry out a perceptual study at one of the local schools for black children to try and understand some of their geographic (spatial) conceptualizations.

2. The study

On 4 March 1994 Mr N I Dlomu (a senior lecturer in the Geography Department of the University of the North) and I visited the Pula Madibogo junior primary school in Mankweng. The principal was very co-operative and allowed us to carry out the survey amongst three groups of standard 2 pupils whose ages varied from 8 - 16 years. They are mostly Northern Sotho speaking but the medium of instruction is English. The objective was to let each pupil draw a mental map to determine his/her conceptualization of selected geographic concepts. Each pupil was given an A3 sheet of paper and asked to draw a mental map. The concept mental map was not used and the instructions were kept to a minimum. Group A was asked to draw: **My Home,** Group B: **My school** and Group C: **My village.** The pupils could decide what medium (pencil, pen, crayon, etc.) they wanted to use. Furthermore no instruction was given whether they should use a ruler or draw free hand. Apart from the topic the only other significant instruction was that they were required to write their name and age on the paper. All the classes were extremely crowded especially group C where two classes were combined because one teacher was ill.

3. Analysis of the drawings

The selected phenomena, **home, school** and **village** provided opportunities to acquire information regarding the following geographic concepts:

phenomenon	–	the prescribed phenomenon eg. home, school, village plus other phenomena eg. motor cars, trees, fences, etc.
size	–	the size of each phenomenon as well as size in relation to others.
scale	–	home, school and village imply different scales (resolution).
location	–	where is the phenomenon placed (correct placing)?
relative location	–	where is it placed with respect to other phenomena (direction)?
orientation	–	plan, front view or perspective.

In the analysis of the drawings specific attention was given to the above aspects. The three topics are discussed separately.

a) My home

The vast majority of the 39 pupils utilised the full page (horizontally) and provided a front view drawing of the house. One gave a good perspective view of his house and a few combined front view and plan. This occurred where they wanted to show some aspects of the inside eg. a table, chairs etc. Since the focus was mainly on the house, few problems were encountered with the placing (location) and relative size of other phenomena eg. trees, cars, fences, gardens, etc. Some drawings showed garages and cars (sometimes even two) television sets, and in one case even an electric globe. Especially the girls often decorated their drawings with flowers in the garden. A moon and/or a smiling sun also decorated some drawings, while barbed wire fences were often very prominent. (See Addemdum A for some examples of drawings).

b) My school

Most of the 39 pupils supplied a front view drawing of the school, which consisted of a long row of classrooms on the western side, two rows separated by a tree on the eastern side, the principal's office (north) and the gate and pond (south). Most children gave a fair representation of the location, relative location and relative sizes of the phenomena but some could not get the placing right. The detail and accuracy in some cases was remarkable. Most pupils confined themselves to the topic and in a few cases birds, flowers, the sun, a dog, etc. were used as decorations. The front view representation of buildings around a quad posed a major problem but most of the pupils solved it by turning the paper through 90° for each of the cardinal directions. Obviously the front view approach was discarded for the pond and a plan representation (seen from top) was given. (See Addendum B for some examples of drawings).

(c) My village

Some of the 77 pupils in this group confined themselves to one or two buildings (often their own house or a church) but most tried to supply wider perspectives. Where the drawing was confined to one or two buildings the front view was given, but plan drawings were used for groups of buildings or street blocks. Only one pupil tried to supply a true perspective view.

For one child one page of A3 was too small and she continued her drawing on the back side. Most of the pupils included a church in their drawings and other favourite buildings were supermarkets, garages, the police station and even the Mankweng hospital. Motor vehicles, people, plants and the sun were also present in many of the drawings. The correct placing often posed difficulty to the pupils. Some for example placed the hospital in town whereas it is approximately 2 - 3 km away. Traditional huts seldom occurred in the drawings because most of the children live in Mankweng which is to a large extent westernized. Many of the drawings were actually a haphazard arrangement of objects but in several *cases* a well organised street plan, residential blocks and houses were given. It is interesting that many pupils have put in robots in their drawings where in fact there are no robots in Mankweng. The hotel in one of the drawings is also non-existent. (See Addendum C for some examples of drawings).

Discussion

Most of the drawings were neatly done with pencil and ruler, often with a bright splash of colour. The large majority of pupils provided a fair representation of the given topic but some obviously narrowed and others widened the scope. The **two dimensional representation** of three dimensional objects posed a major problem, but most solved it by using front view drawings of isolated objects and perspective or plan drawings of grouped objects. Most pupils had a fair idea of **size** and **relative size** but reflecting it in a drawing was not always easy. The way in which the home, school and village was represented indicated that the pupils could conceptualise **scale** to some extent while most were quite good with **direction.**

Conclusions

Any conclusions drawn from the drawings, should be very carefully done. To some extent a mental map reflects knowledge but the robots, hotel and even the helicopter

in one of the drawings point to a good dose of imagination. Furthermore very few people have the ability to draw what they see, encounter or remember.

Therefore it will be a fair assumption to say that it seems as if most pupils at the age of 10 years can to some extent conceptualise **phenomena, size, relative size, location, relative location, scale** and **direction.** It seems as if **orientation** is usually in front of the object as shown by the front view and perspective drawings. As soon as the area under study becomes bigger the pupil transforms himself/herself to somewhere above the objects to draw a plan. The pupil, however, is still confined to his/her own environs and basically the earth is still flat. Spherity, however, is present and cognisance of it is reflected in the addition of the sun and moon in some of the drawings. The elements of a mental map viz **paths, edges, districts, nodes** and **landmarks** are often to some extent present in the drawing of my **village,** but it seems as if they are not well defined.

Consequently it is maintained that a 10 year old child is ready for the judicious introduction of several geographic concepts but that complicated concepts must be avoided at this stage.

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Appendices

Addendum A: My house
Addendum B: My school
Addendum C: My village
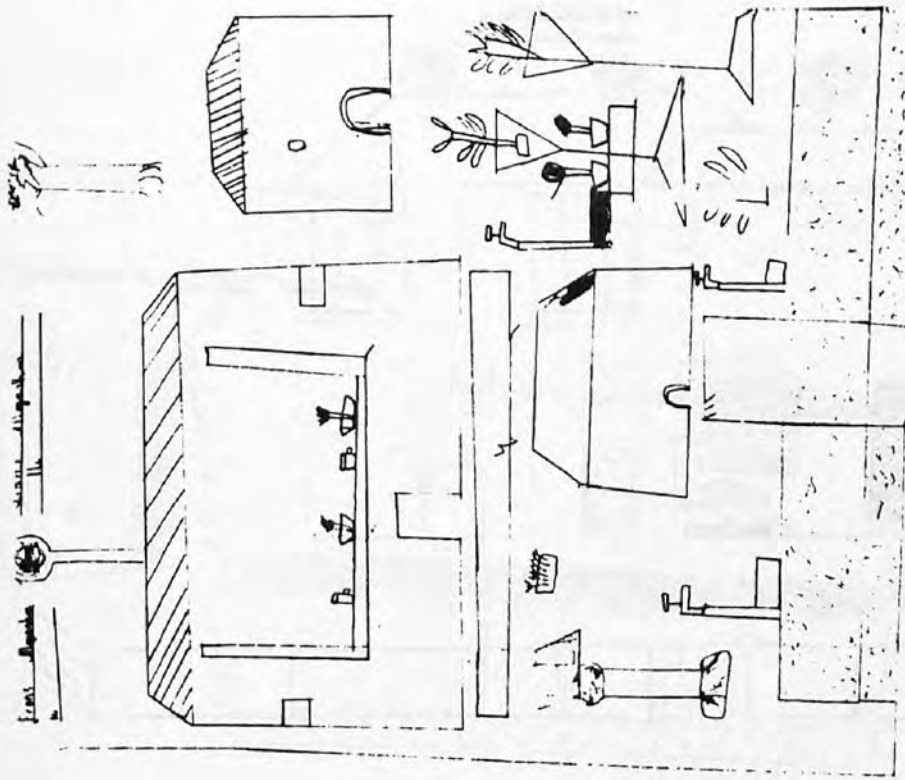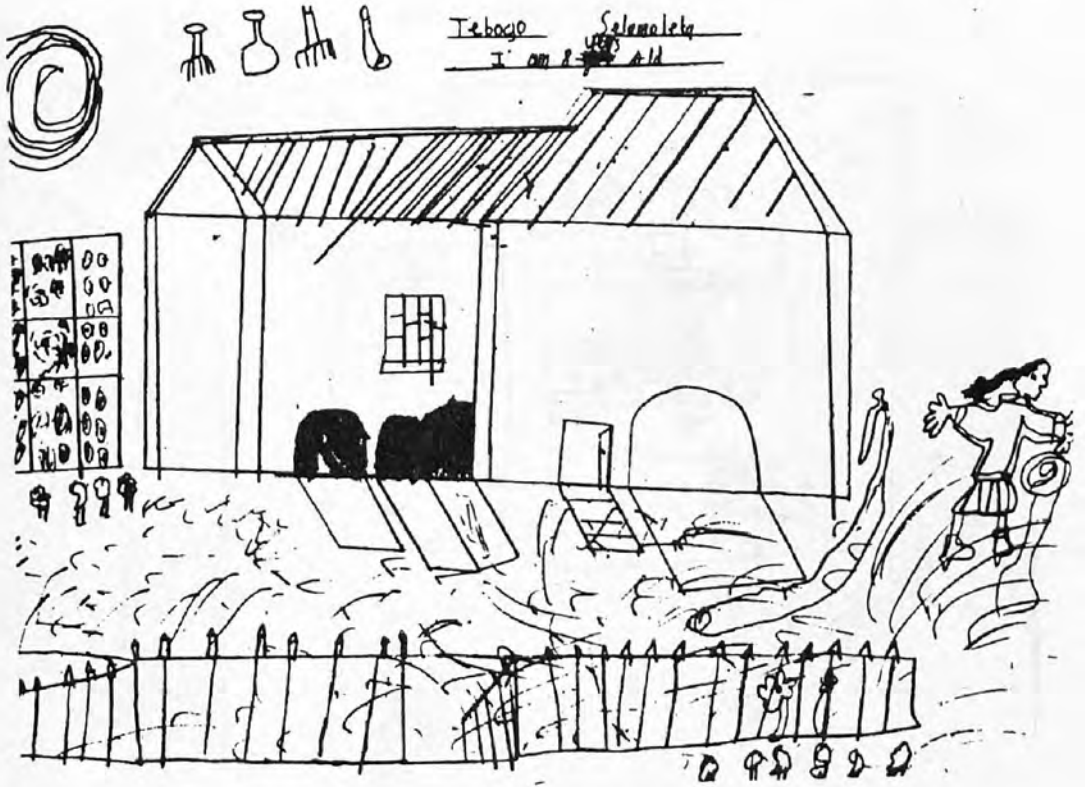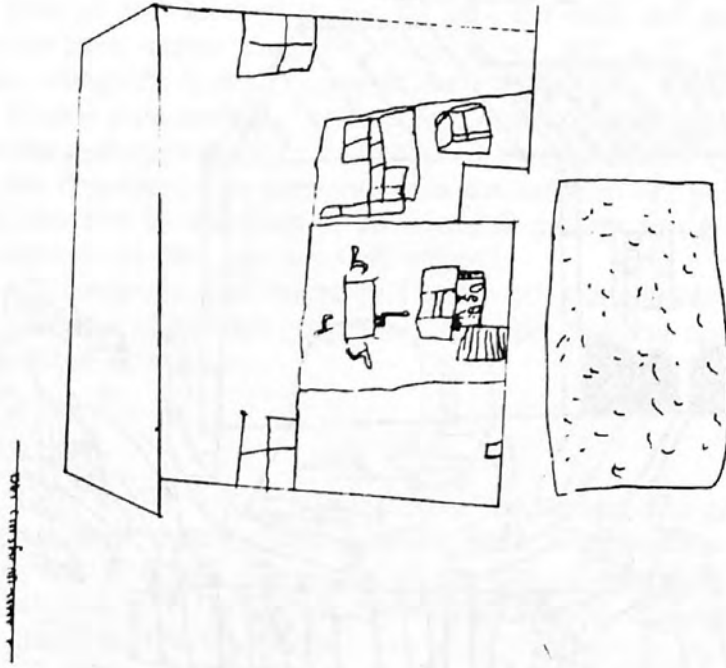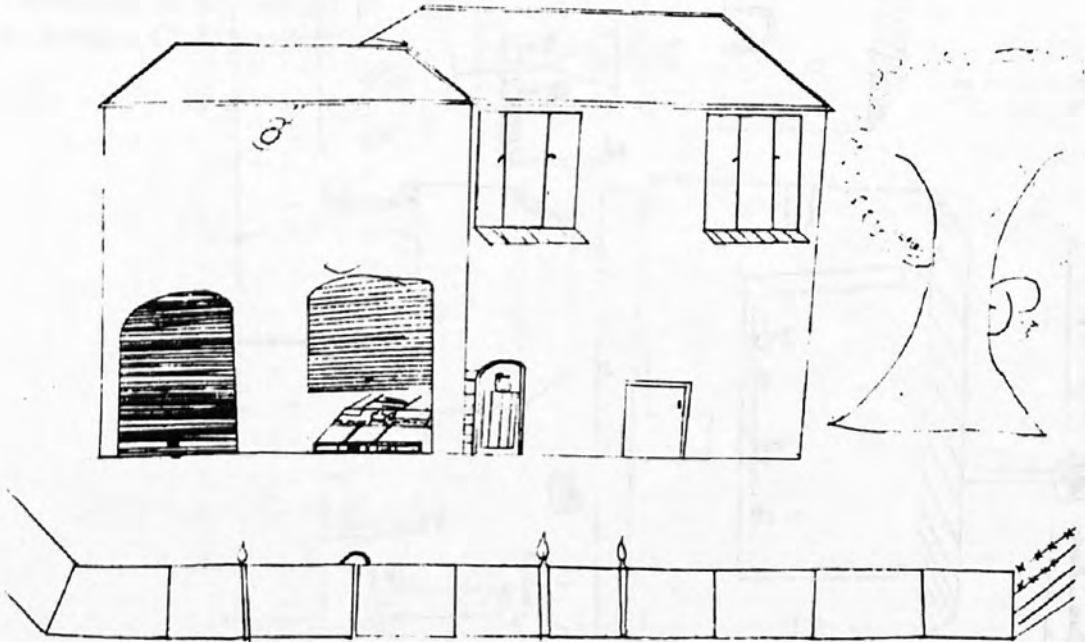
Tebogo   Salemaleta
I am 8 years old

Joseph Maponya 9 year old

Sebelo   Maliba   9 years old

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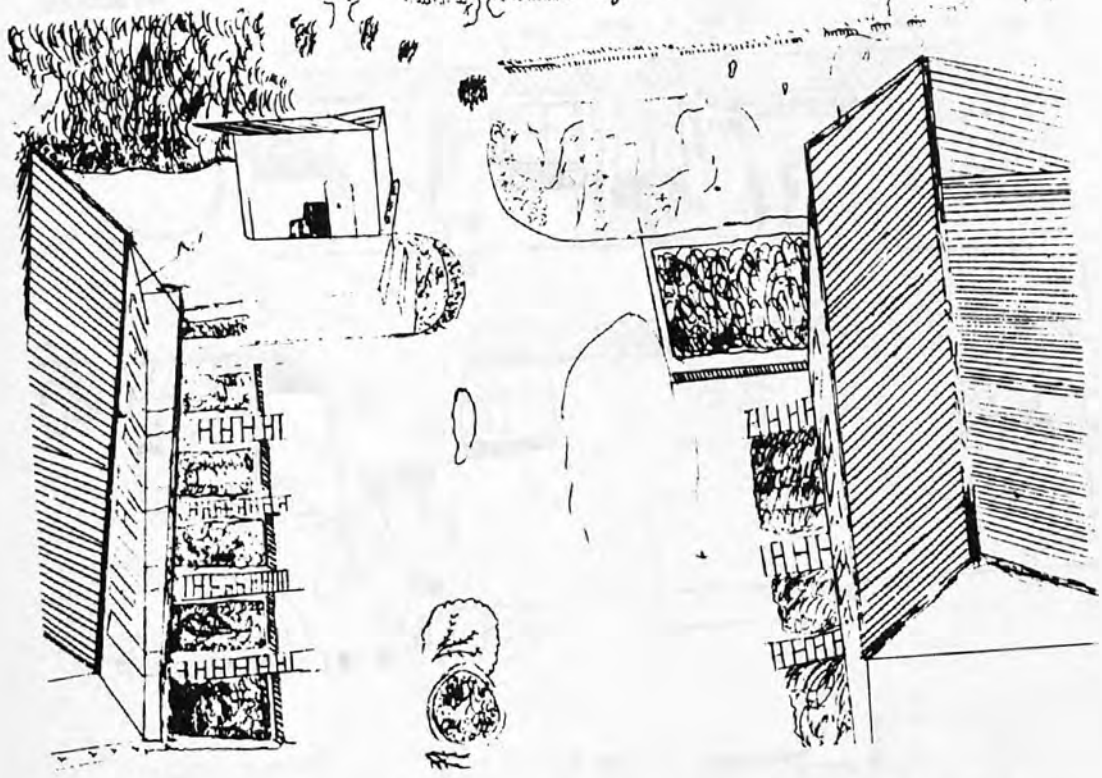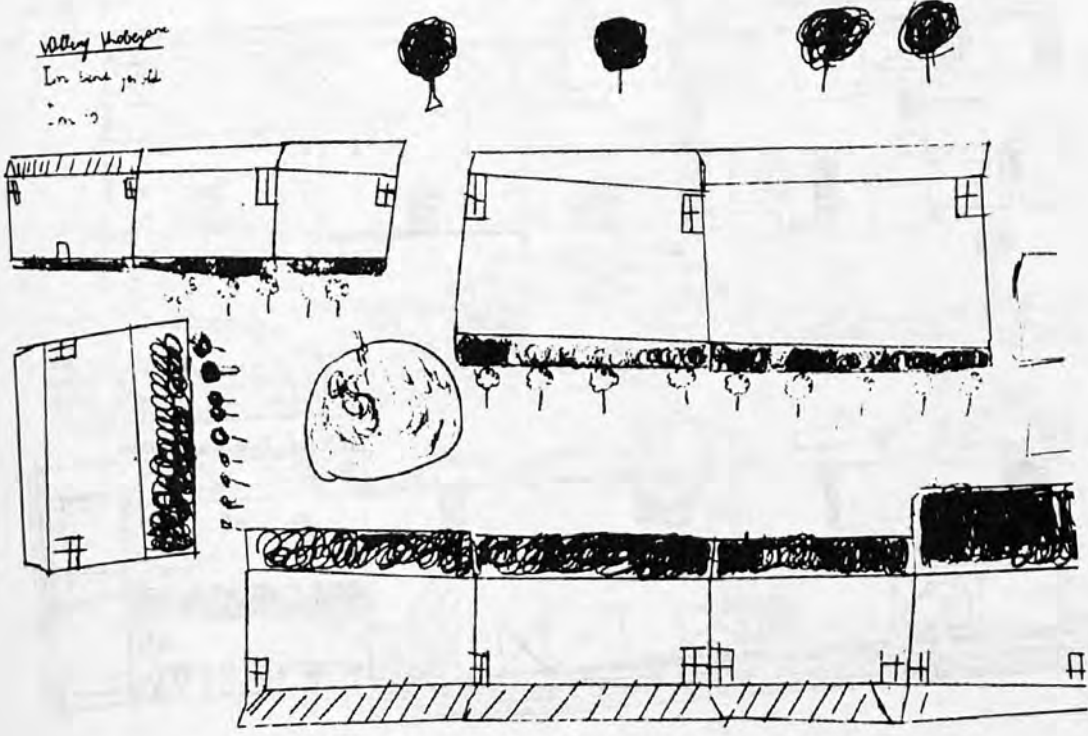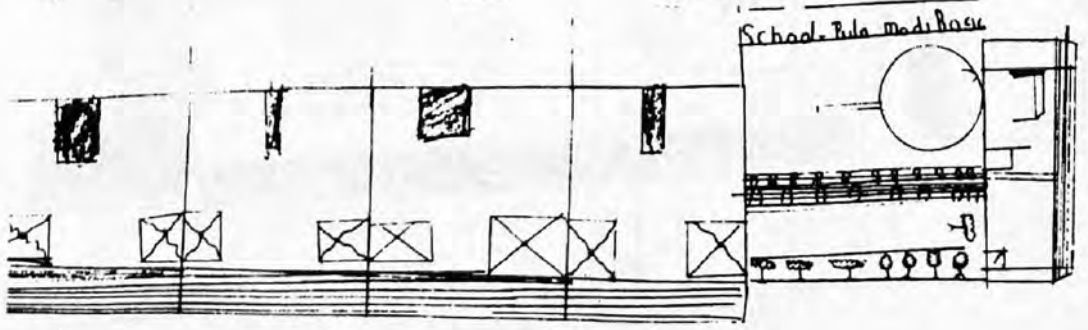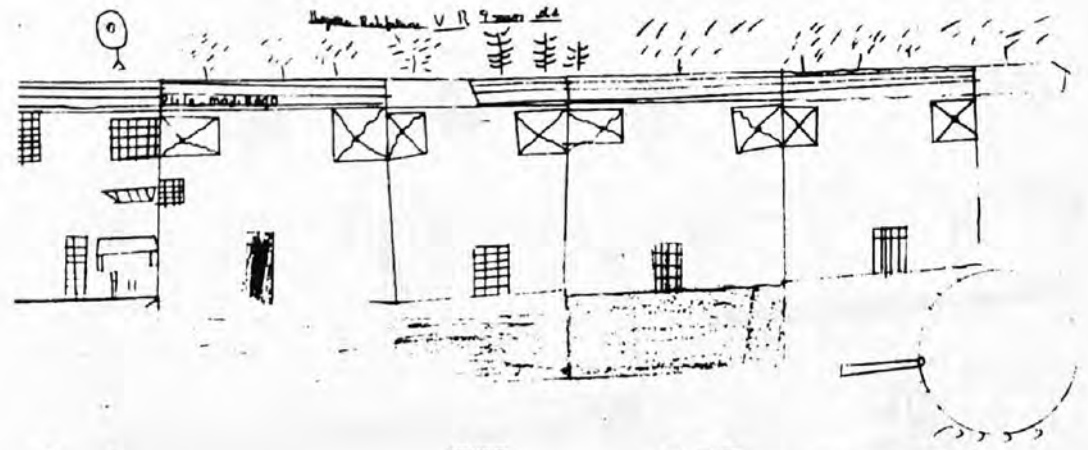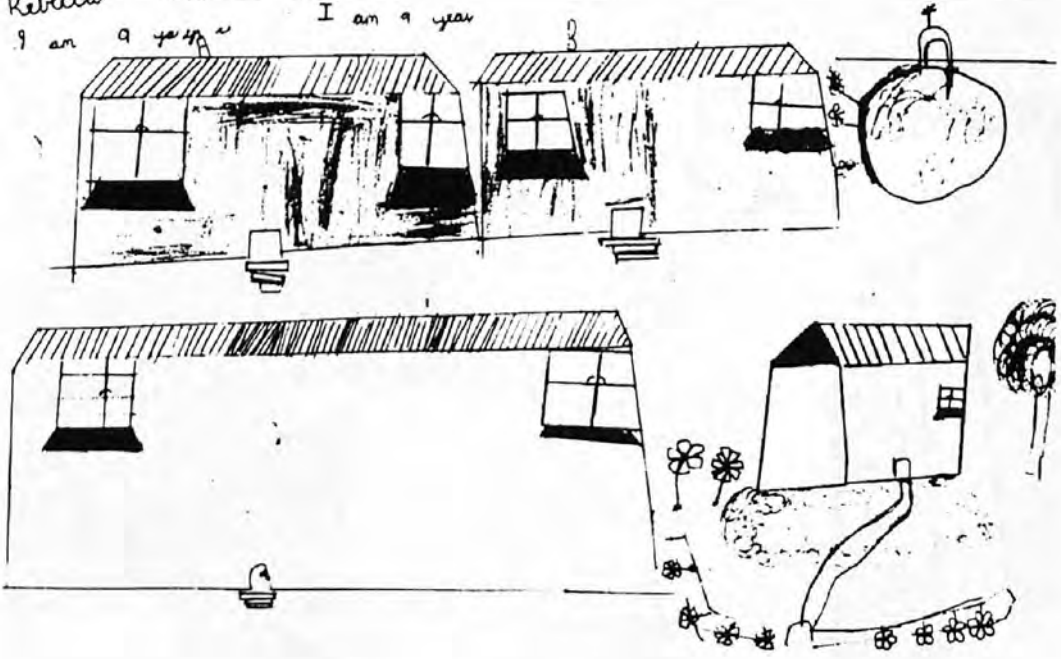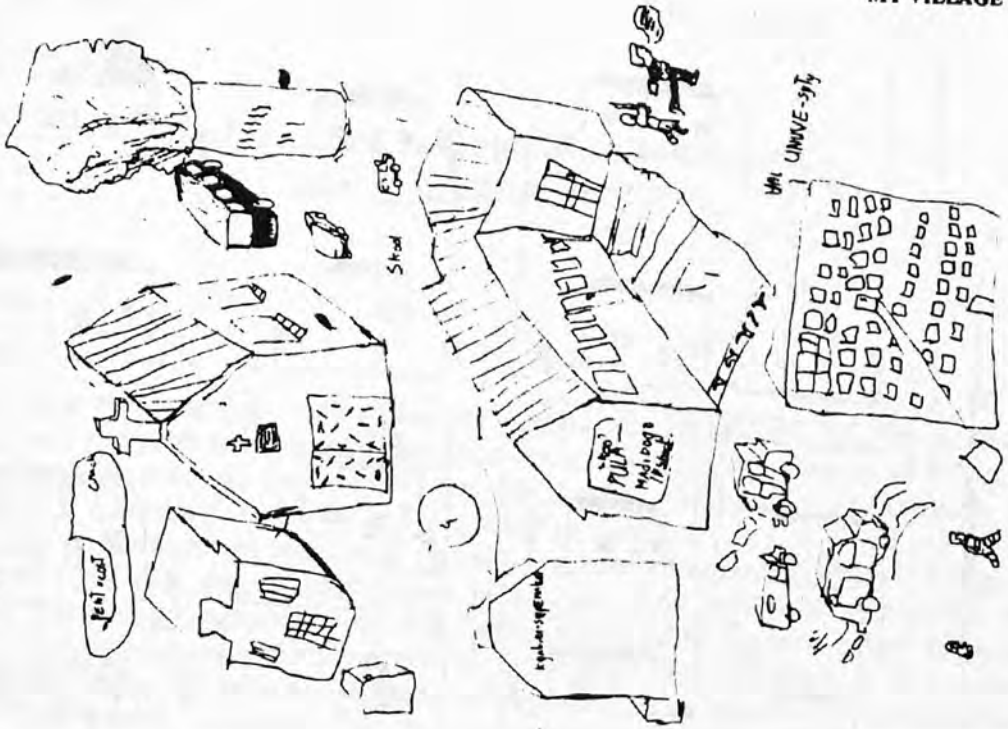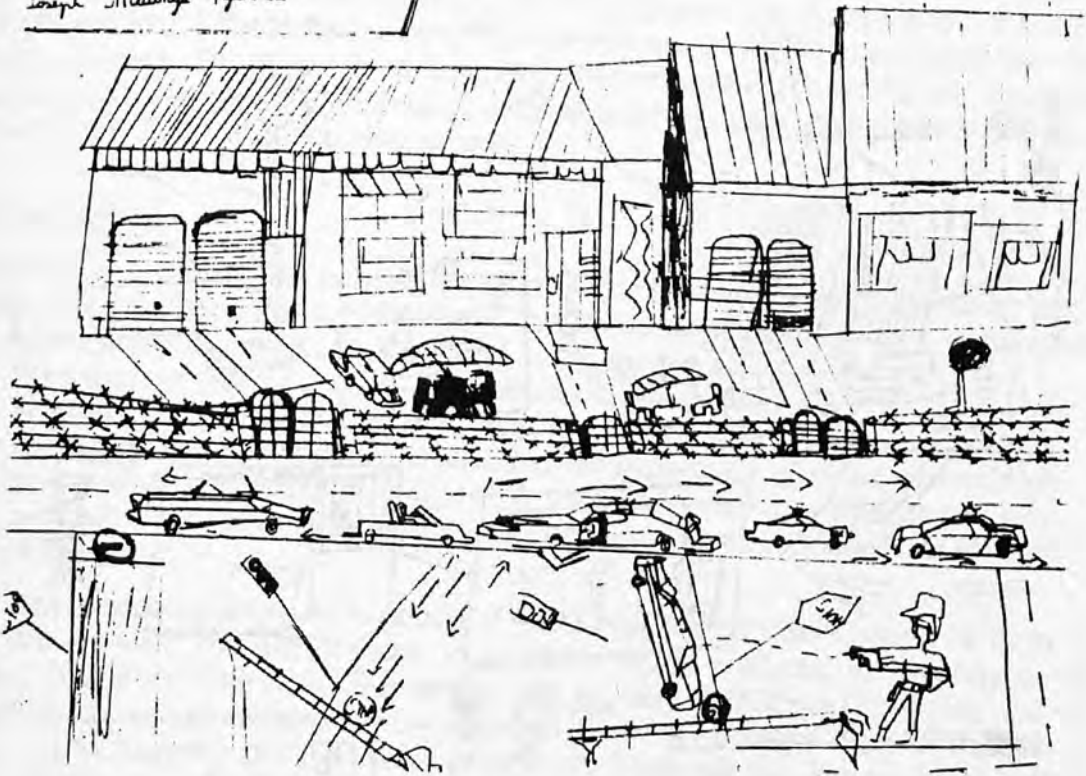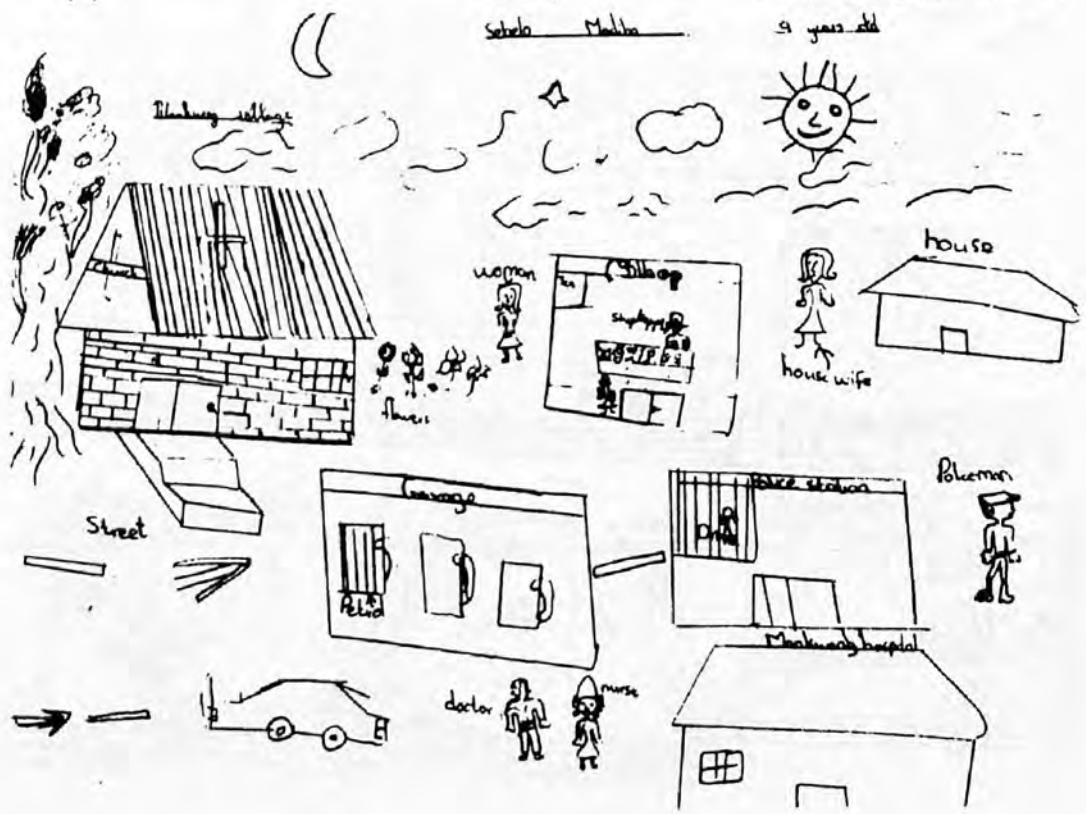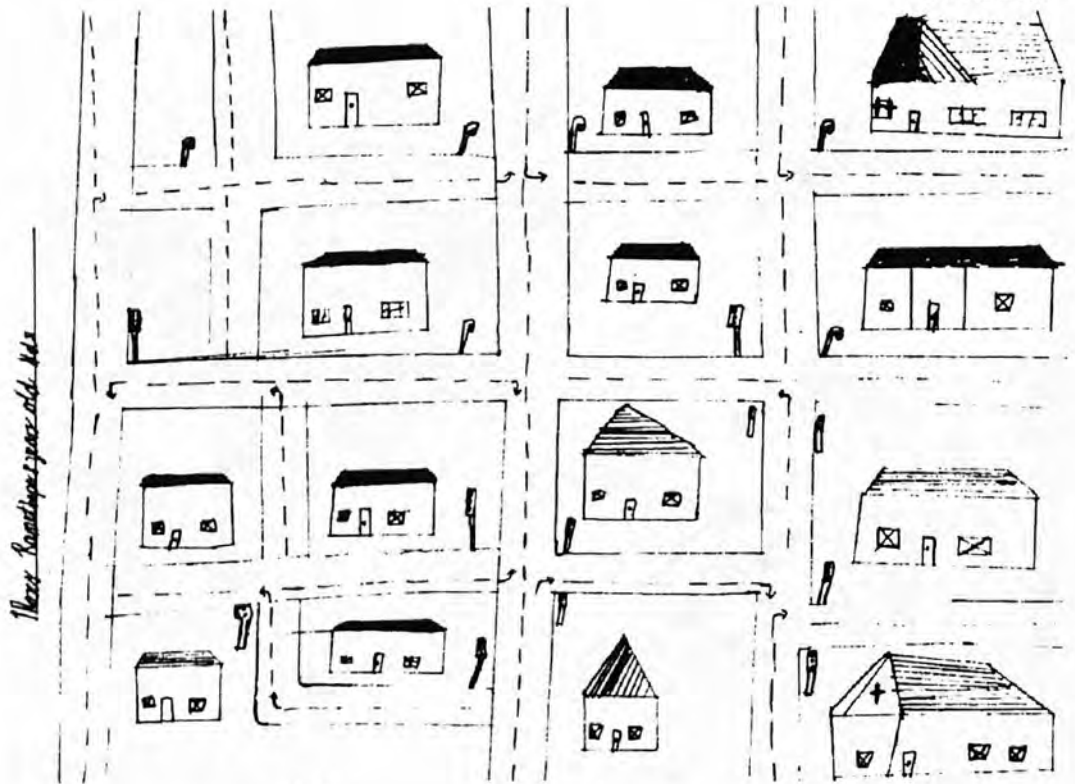
CHILDREN'S UNDERSTANDING OF GRAPHIC REPRESENTATIONS OF QUANTITATIVE DATA

Rod Gerber, Gillian Boulton-Lewis and Christine Bruce

Abstract

Children are encountering more and more graphic representations of data in their learning and everyday life. Much of this data occurs in quantitative forms as different forms of measurement are incorporated into the graphics during their construction. In their formal education, children are required to learn to use a range of these quantitative representations in subjects across the school curriculum. Previous research that focuses on the use of information processing and traditional approaches to cognitive psychology concludes that the development of an understanding of such representations of data is a complex process. An alternative approach is to investigate the experiences of children as they interact with graphic representations of quantitative data in their own life-worlds. This paper demonstrates how a phenomenographic approach may be used to reveal the qualitatively different ways in which children in Australian primary and secondary education understand the phenomenon of graphic representations of quantitative data. Seven variations of the children's understanding were revealed. These have been described interpretively in the article and confirmed through the words of the children. A detailed outcome space demonstrates how these seven variations are structurally related.

Introduction

We live in a society that is being exposed to graphic images on an increasing basis. This exposure is part of a global trend to graphic communication as a complement to verbal communication. As Kress and van Leeuwen (1990:3) state:

We want to treat forms of communication employing visual images more seriously than they have hitherto been treated. We have come to this position because of the overwhelming evidence of the importance of visual communication, and the staggering inability on all our parts to talk and think in any way seriously about what is actually communicated by means of images and visual design.

We can treat graphics more seriously if we accept the pervasive nature of them in modern society. The use of icons to represent major products; the importance of logos to market companies, institutions and sporting teams; the increasing use of graphics for communication in environments where speakers of different languages mix ,e.g. at airports; and the use of graphics as labels on sporting goods, all reflect the need to treat graphics as an essential element in everyday living.

The treatment of people's understanding of graphics is a strongly socio-cultural activity. Rogoff (in press) claims that "developmental research has commonly limited attention to either the individual or the environment" and "even when both individual and environment are considered, they are regarded as separate entities, rather than being mutually defined and interdependent in ways that preclude their separation as units or elements." This is similar to the claim by Marton (1993:3) that it is impossible to consider the object of the experience,i.e. the problem, and the subject, i.e. the learner, as two separate entities. The promotion of a non-dualistic ontological perspective which accepts that there is only one world which is experienced and understood in different ways by people is essential to understand how people encounter, understand and use graphics in their lives.

Such an approach contrasts with an information-processing approach in cognitive psychology in which the foci of the experience are the forms of mental processing that people engage in as they interpret graphics. Paivio's dual coding theory (1978), Kulhavy's theory of conjoint processing (Kulhavy, Lee & Caterino, 1985), mental models that produce analog mental representations (Vosniadou & Ortony, 1989) and the concept of structure-mapping (Clement & Gentner, 1991) illustrate the different ways in which psychologists use graphics in their learning activities. Schnotz, Picard and Hron (1993), for example, focused on the dynamic aspects of knowledge acquisition in their investigation of how successful learners differ from unsuccessful learners in their processing of text and graphics. They concluded that successful learners use a graphic more intensively in that they include more entities in their mapping between the graphic and their mental model than do unsuccessful learners, and that successful learners adapt more to the demands of the mental-model construction. Therefore, successful learners are more likely to retrieve model-building information at those points of the learning sequence where new entities are to be introduced into the model, than do unsuccessful learners.

These theories and research results may be useful, but they do not take into consideration Vygotsky's (1978) interest in the mutuality of people and their socio-cultural environment. Nor do they take into consideration the wholistic nature of the construct of activity (or event) as described by Leontiev (1981) in which human action is defined by its energising force(i.e. activity in relation to motive), the goal of the activity and the operations involved in the activity. Meaning can therefore be found in the relations between the levels of activity and action, and those of action and operation (Lave, Murtaugh & de la Rocha: (1984) 72-73). Therefore, the use of activity as the unit of analysis "allows for a reformulation of the relation between individual and social and cultural environment in which each is inherently involved in the others' definition. None exists separately."(Rogoff,in press)

The relational role between people and graphics in different life-world experiences may be examined on the basis of specific activities or events in which they encounter such graphics in a particular institutional context, e.g. in a school curriculum. An investigation of this situation is an investigation of human awareness. Marton (1993:13) declares that such awareness "denotes everything that is experienced simultaneously in whatever way that it experienced." Using Gestalt psychological principles, Gurwitsch (1964) differentiates the theme of an investigation (i.e. the object of focal awareness), from the thematic field (i.e. related aspects of the experienced world in which the object is embedded), and the margin (i.e. existing information that is peripheral to the object of study). Therefore, studies of human awareness that are based on designated activities or events need to be investigated in

close relation to their contextual settings. People's understanding of graphics is an example of such a study.

An extensive body of research indicates that children encounter challenges when using graphics. Gerber (1981, 1984, 1985, 1988, 1991, 1992) has demonstrated that children throughout the formal years of schooling experience a wide range of difficulties understanding the various elements of maps, before they are able to interpret the geographical information contained in the maps. These conceptual difficulties, together with a range of personal factors, combine to reduce the effectiveness of each learner to derive meaning from these maps. Ottoson (1987) claims that conventional thinking about teaching methods for elementary map skills may contribute to problems in understanding, as children are mostly encouraged to view the map as a 'birds-eye view' rather than as a 'miniature' of the real spatial relationships that it represents. He also claims that the central difficulty in basic understanding of maps lies in the conception of the spatial relationships between the objects of the map, and not, as is often presupposed, in understanding symbols, projections or scale.

Studies of the understanding of graphs and charts reveal varying results. In reviews such as that by Macdonald-Ross (1977) comparisons were made of how well different types of graphs and charts function in the reading off of values. The purpose of these studies was to advise on which graph or chart to use for representing designated information. Studies of how children cognise graphs have shown that reading off values is generally mastered by age ten years (Barclay,1987; Bryant & Somerville, 1986; and Wainer,1980). It has also been concluded that school children often have considerable difficulties proceeding beyond this basic level of reading off values and drawing conclusions from the data represented on the graph (Barclay, 1987). Misconceptions of a graph as a picture have also been detected (Linn, Layman & Nachmias, 1987; Preece,1983). In such studies, confusion exists between the fact that the spatial relationships on a map represent spatial relationships in reality whereas the spatial relationships on a graph or a chart most often represent relationships that are not spatial. This makes the connection between understanding graphs and charts on the one hand, and understanding maps, on the other, especially interesting.

What is missing from much of the research reported above is the non-dualistic ontological approach that is necessary to capture the relational linkage between the problem, i.e. understanding of the graphic representation of data, and the subject, e.g. children operating in a school environment. To capture the experience of reading and interpreting graphics in real-world situations and the nature of the human awareness that is exhibited during this process it is necessary to design and implement studies that allow people to demonstrate and reflect upon their experience using a range of graphic representations. The following study seeks to redress this situation by reporting on a contextually-based investigation involving a variety of graphics.

Eliciting Students' Conceptions of Graphics using the Phenomenographic Approach

This study adopts a phenomenographic approach to research. Phenomenography aims to reveal the qualitatively different ways in which people see, experience, understand and conceptualise various phenomena in their world (Marton, 1981 and 1988) . The starting point for this approach is an empirical observation that whatever phenomenon

people encounter, there seems to be a limited number of qualitatively different ways in which the phenomenon is understood. The focus is on describing the students' ways of thinking about quantitative information that is represented in maps, graphs and charts. The researchers are not attempting to "look into the learner's mind", but rather they are attempting to see what he or she sees and experiences when using these graphics. These different conceptions which are identified represent different ways in which the maps and charts appear to individuals. In phenomenography, it is the very categories of description and the development of an outcome space that demonstrates the relationships amongst these conceptions that constitute the main results of the research.

The participating students

Students participating in this study came from three different schools: the first was a school for boys, the second for girls, and the third co-educational. The students represented a range of age groups coming from Grades 3/4 (approximately 8 years old), Grades 6/7 (approximately 11 years old), Grades 9/10 (approximately 14 years old) and Grades 11/12 (approximately 16 years old). All students were studying social science subjects which involved the use of maps and charts to varying extents. Amongst the youngest students interviews also ascertained that they had contact with maps and charts outside the school context through participation in groups such as Boy Scouts and Girl Guides, watching television, reading newspapers and travelling.

The interviews

The data about the students' experiences with graphics representing quantitative information were obtained through a series of phenomenological interviews using the principles detailed by Kvale (1983). These interviews with the students were conducted on their school premises, usually in the library or in another familiar environment. Each interview lasted approximately one hour. During this time students were introduced to the project, and given a few minutes to peruse the maps and charts which were presented to them in a folder. The maps and charts they were working with represent an imaginary world, the GRAK world. Each country in the GRAK world was modelled on a real world counterpart, so that in total a range of industrialised and developing countries were represented. Countries in the GRAK world are geographically located to reflect some of the spatial relationships between their real world counterparts. Thus Catonien and Esoria are neighbours, separated by sea from Agnien and Daseland, which are also neighbours, and Bovenesia is separated spatially from the other countries.

The data were encapsulated in seven maps and charts depicting the following aspects of the GRAK world:
1. Population Density (Thematic Map)
2. Age Distribution (Graphs-Population pyramids)
3. Birth and Death Rates (Thematic Map)
4. GNP per capita from 1950-1988 (Line Chart)
5. Distribution of production 1965 and 1988 (Bar Graphs)
6. Major Exports 1965 and 1988 (Pie Charts)
7. Imports and Exports (Thematic map depicting trading patterns)

After the students had perused the maps and charts they were asked the following question: *What can you tell me about the GRAK world?* The question was selected

as the result of a pilot study which tested a range of questions, as it allowed the students freedom to structure their own description of the GRAK world. All the students were invited to deal with the maps and charts as they chose, either leaving them in the folder or spreading them out on the table. During the interview phenomenological principles of bracketing, description and horizontalisation were applied by the interviewer to ensure truthfulness of the students' responses (Spinelli 1989). The application of such principles in the data gathering and analysis phase of phenomenographic research lends validity and reliability (Gerber 1993, Sandberg 1994).

Each videotape was transcribed verbatim for analysis, the transcriptions were also extensively annotated to supplement the spoken data with descriptions of students behaviour. The analysis followed established phenomenographic techniques (Marton and Saljo 1984, Saljo 1988, Dahlgren and Fallsberg 1991).

Conceptions of Graphics: Outcomes of a Phenomenographic Analysis

The outcomes of this study are seven categories of description representing conceptions of graphics, each of which is logically related to the others. These logical relations are described diagrammatically in the form of an outcome space (Figure one). This outcome space describes, in a graphic form, the linkages between the categories, expressing in a distinctive way the structural differences between the students' conceptions of the maps and charts.

The outcome space, which is a new representation of the phenomenon studied (Marton 1993), is predominantly hierarchical, each category, or pair of categories being more complex than those preceding it. The categories are divided into two distinct groups separated on the outcome space by a dotted line. The first group, comprising categories one, two and three, represent unsophisticated, problematic ways of experiencing the graphics, whilst the second group, above the dotted line, represent ways of experiencing the graphics which have more descriptive power and greater accuracy.

In the first category, students focus not on the data, but rather on idiosyncratic features of the maps and charts which they then relate to their limited understanding of the world in a largely inaccurate way. There, the students not only experienced difficulty in understanding the content in each graphic, but they were unable to process the information evident on the graphics in a coherent manner. In categories two and three students focus on the data represented in the maps and charts, but in an incomplete way. However, they differ considerably in what is the focus of attention on the graphics and how the data is interrogated. In category 2, the lack of understanding of the purpose of the graphics led students to make unrealistic claims about the contents on different graphics. Their intention to focus on isolated parts of the graphics meant that the students were unable to interrogate the whole graphic at any one viewing. In category 3, the students were able to consider the purpose of the whole graphic but they were unable to comprehend its meaning because they could not interpret the meaning of the information portrayed on the graphic in an accurate way. Students in this category were unable to relate the data across the graphics.

They are each also distinguished by a significant limitation in the students repertoire of knowledge and skills. In category one students do not understand the
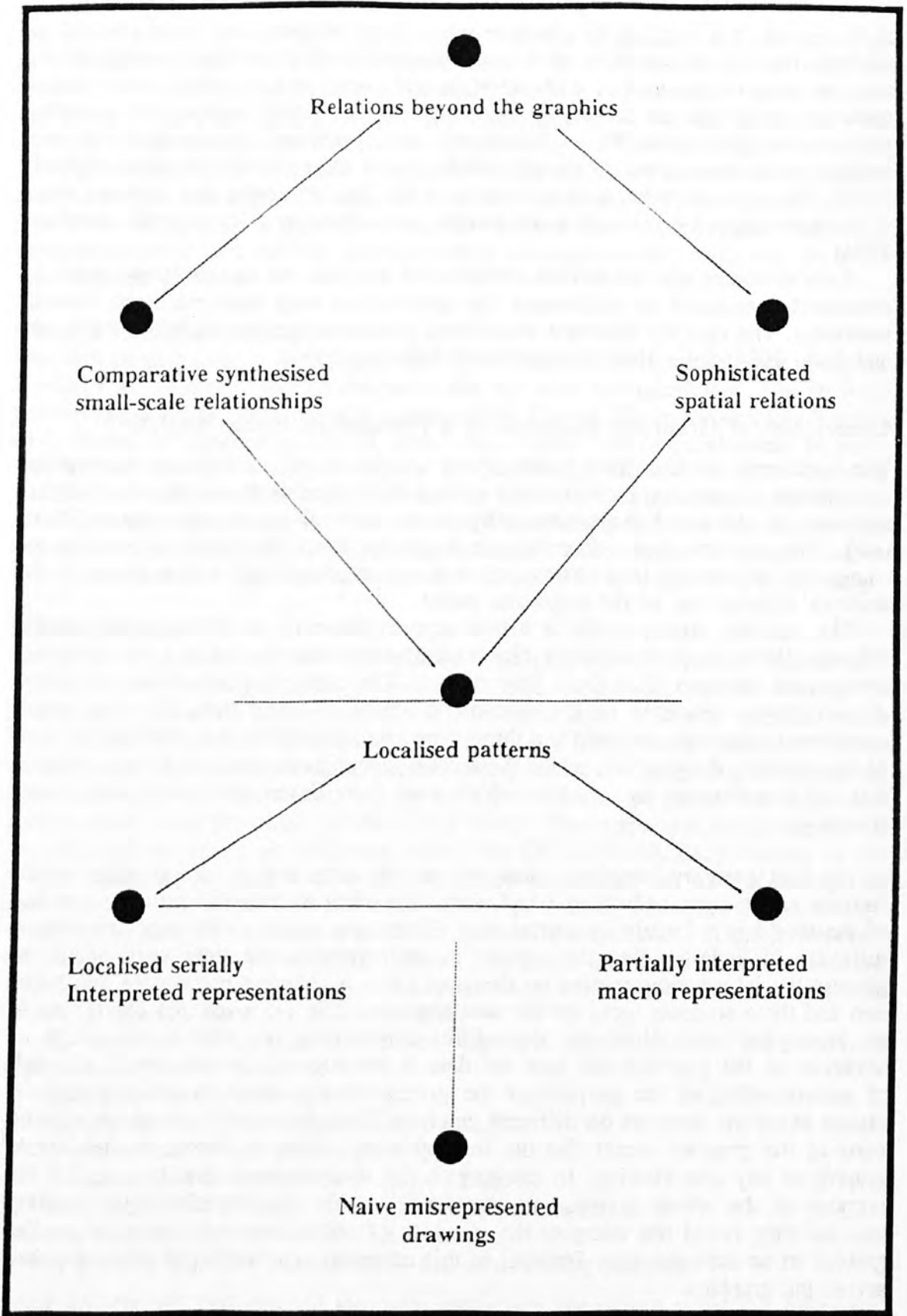
Figure 1: Outcome space of the conceptions of graphic representations of quantitative information

nature of maps and charts. The major gap in conception two is an inability to read the titles. In category three it is misunderstanding the representations (symbologies), including difficulties with the statistics represented.

Categories, 4, 5 and 6 represent static views of the maps and charts, but there is evidence of increasingly accurate interpretation of the quantitative information. However, the processing of the information varies across these three categories. Category 4 is characterised by the students' focus on the patterns across one or two maps and/or charts in a single country. Once the patterns of this country were contemplated, then those for another country were considered. There was no attempt to relate the resulting patterns. In Category 5, the students consider the spatial relationships between countries seriously. They generate comparisons that are based on the multiple use of the graphics. This approach leads to a understanding of the countries in the GRAK world. Category 6 is a more sophisticated treatment of the GRAK world by the students in which the data from the graphics is used flexibly and in multiple forms to generate an accurate synthesis of its socio-economic characteristics through considerations of the data trends revealed in the mix of graphics. Aside from references to experiences derived from the students' lives or which they read about, the data used in these three categories resided only on the graphics.

Category 7 is the only one in which the students seek to extend beyond the data through either extrapolation or prediction. These cognitive processes are completed on the basis of accurate understandings of spatial concepts and patterns and consistent, competent use of the graphics in multiple and flexible ways.

Each category is described in detail below.

Conception One: Graphics are seen as naive, misrepresented drawings

In this conception the map or chart is seen as a picture of the world, a 'naive drawing' such as may be produced by a child. The data as such are not understood at all when the map or chart is experienced in this way. In this conception the maps/charts are invariably investigated in a serial fashion, (One-by-one), but not all the maps and charts are investigated. The purpose of each map/chart is overlooked or not understood.

The naive drawing conceptions may be clearly seen in a range of transcripts of interviews from the youngest children. Understanding the particular focus which is associated with this conception is aided by the examination of transcripts in which the student regularly switches conception. In transcript 25, for example, the student focuses on the green colouring surrounding the countries in which the data is represented. Because of the student's inability to understand abstract map symbols, there is an inability to understand that the green colour doesn't necessarily refer to an area of lush forest. The student has not been able to decode the meaning of the symbol and to apply an accurate understanding to an imagined situation:

25(2) Cause this is all green around here, so they might have a couple of lakes around there..... probably means like its got all green land, and its like all nice forest instead of having all this dry. The people who live in these countries would probably get a lot of food because they could fish and they could also pick berries and stuff if that's growing.

This focus on portions of the map which are not central to its intent is interpreted in terms of the child's limited understanding of the world. This choice of focus on

the student's part is clearly deliberate, he has brought one of Gurwitsch's 'marginal' aspects of the map to the fore, essentially pushing aside the intended 'thematic aspect', because of his inability to interpret abstract symbols. Essentially the student reverses the intended figure -ground relationship in the map. This is evident in his response to a question about the colours inside the countries:

25(3) Well, it probably means how much people were probably in the parts because I didn't really get that part.

When the child responds to encouragement by the researcher to focus on the colours 'inside the countries' (on the Population Density Map), his experience of the map undergoes a qualitative shift; he recognises that data of some kind are being represented and recognises that the map key encodes that data. However, the interpretations are still naive because the concept of population density is not understood. This indicates that the student does possess a limited understanding of key spatial concepts that are represented on graphics, especially on maps:

25(3) ...I just think its like how many people, its like how many villages are in there, how many people are in there. And the dark orange means that there's one thousand five hundred and one and up to two thousand people. And the lighter one....the means eleven to one hundred. And the brown means two thousand and one up to three thousand five hundred...so it could be a bit squashy there.

The moment the student takes his attention away from the data, other elements of the map again become figural; the naive drawing conception, with the associated elements of fantasy, is reverted to:

25(4) Well, it would be quite a peaceful country because its got a lot of greenery around, and I wouldn't think just like small countries like that would have so many weapons. So they might be kind of like a peaceful country, and it could make very nice stuff there with all this lake (the Moria Sea) they might find like little gold pieces of shells, nice shells, so you could like decorate a garden....

These elements of fantasy are not extrapolations from the data. Rather, they consist of fantastic interpretations that bear no resemblance to reality or as a sensible interpretation of the data represented on the graphic. The naive drawing conception is also striking in the case of a child interpreting the Birth and Death Rates Map. This child can read the title of the map. He is unable, however to interpret that title sensibly. When asked about the meaning of the title he replies:

30(9) Birth means like first born or something. Death means when it dies....

The purpose of the map is expressed through its title. This is the explicit statement by the map designed to inform the map user what the thematic element of the map is. When people fail to grasp this intention they limit their chances for understanding the data represented on the graphic. The same student has considerable difficulty reading the title of the Population Density map. The few words which he can read he cannot understand:

30(4): Interviewer: Can you read the words on top of the map B....?
No.
Interviewer: No? Can we have a try?
I can't figure out that one (population), it's a hard word.
Interviewer: Can you figure out any of the others?

Yep...in the world of GRAK.....is that 'density'?
Interviewer: What do you think it might be density of?
(student shrugs shoulders)
Interviewer: what's density?
I don't know.

This inability to understand the intention of the map is also manifested in the student's lack of understanding of the symbology, similar to the previous confusion described about the green coloured areas on the map. When the student is asked again to tell the interviewer what the map is about, he draws immediately on these misrepresentations:

30(9) Crazy countries...the different shapes and everything. And they've got red dots and black dots in, and they're funny names.
Interviewer: And what do the red and black dots mean again?
The reds could be cities and the black could be houses.

This idiosyncratic representation continues when he describes the red borderlines and the circles which constitute the maps representation of the birth and death rates:

30(10) Interviewer: What do you think these lines are here?
Oh roads.
Interviewer: What about the lines around the countries?
Could be ranches and everything....Could be little rivers. And those could be lakes or something..... Those could be dirty lakes (black circles) and those could be clean (red circles).

This student's misinterpretation of the symbols on the maps, continues as he describes the Trade Map. Again the way of looking at the map as though it were a child's drawing, which results from this kind of focus, is striking. The arrows on the map are misconstrued as amphibious aeroplanes:

30(12-13) I wonder what those arrows mean (long arrows)....It could be bridges.....But I still don't know what these big arrows mean? (fat arrows as in Daseland and Agnien)....those could be aeroplane things and they take off, could be water aeroplanes.

The same child described the major trading bar between Agnien and Daseland as 'the Harbour Bridge of the Grak world' (30:14).

The arrows on the Trade Map are understood by some students as pointing the way. This may be linked to previous experience of maps as being designed to 'show the way':

32(10) Interviewer: What do you think these lines are over here?
They're pointing to other cities...so they can lead the way..
Interviewer: what do you mean by lead the way?
Like, if they were over here, they would lead you to over there.

This interpretation recurs amongst the younger students:

27(21): Interviewer: What do you think the arrows mean?
To show where different places are?
Interviewer: And what about the different lines here?
To show how to get to the different countries?

The 'naive drawing' interpretation is also evident in regard to quantitative data presented on the different charts. Similar inabilities regarding the abstractions of the

symbols, the interest in fantastic generalisations and the disregard for the purpose of each chart were also evident here. Occasional linkages were made with familiar events in the child's world, even though these may not be related to the data on the chart. The pie charts portraying exports, for example, are identified as difficult, and the following reason given:

> 30(19) 'Cause its got circles and things, and its got cut out things like in a pizza.

This tendency to relate the chart to naive, familiar, images of the world also occurs with the age distribution chart:

> 30(22) That's like stairs going up, up, up into an elevator there...

This conception may also be illustrated by an eight year old girl's interpretation of the Export Pie Charts. The titles of the chart and the data embedded in it are completely disregarded. When asked to tell about the Pie charts she says:

> 27(17) It shows where the sun and moon goes to point in different countries.
> Interviewer: It shows where the sun and moon?
> Shines in different countries. (and a little later)
> Interviewer: which one's showing where the sun shines, which one's showing where the moon shines?
> That is the sun (Left chart for Esoria-1965) and that is the moon (right chart 1988).

The Export Pie charts were experienced as other pictures. One child takes the black portion of the charts to represent 'oil spills' in the country. As she talks it becomes clear that the black portions represent parts of the country which are covered with oil; she prefers to live in the lighter coloured parts so that she won't be 'in the oil':

> 32(29) ...Catonien... it hasn't had an oil spill and that, its starting to do it here (on the 1988 Pie Catonien is beginning to export industrial goods represented by black).....I would live here so that I wouldn't be in the oil.

In some cases, unfamiliar words are readily related to familiar aspects of the student's lived experience. The willingness to do so reflects the extent to which the student's experience is mediated by the world in which they live. This is demonstrated in one student's interpretation of services and agriculture when looking at the distribution of production charts:

> 28(11): Interviewer: What do you think services are ...?
> We have David Jones, and Myers... and in America they have Disneyland and in Japan they've got a copy of that...
> Interviewer: what about services?
> Here in Australia, some of our agriculture is our wildlife and the Aborigines...

Conception two: Graphics are seen as localised, serially interpreted representations.

In this conception the maps and charts are recognised as presenting actual data about the countries. In contrast to the 'naive drawing' conception, the purpose of a map or chart is partially understood. However, the nature of the intended meaning is misunderstood at the macro level. That is, students assign incorrect meanings to the maps/charts as a whole whilst dealing with isolated features of the maps or charts. This conception is significantly different from the first one in that the data are

recognised as such, despite the fact that they continue to be misunderstood. Essentially, the students' focus is on the data at a localised level on a graphic, without appreciating the overall message intended to be conveyed by the map or chart. Specific sections of a chart or an area of a map become the focus of a student's attention whether they are central to the theme of the chart or map or not. Such foci reduce the opportunities for the students to make sensible spatial interpretations. This conception is not confined to younger readers. In this conception the maps and charts are read serially.

Misunderstanding of the map or chart is usually due to an inability to read or understand its title which leaves the student 'guessing' what the chart or map is about. As a result the students do not appreciate the purpose of each graphic. Often single words or symbols which appear on the map/chart are taken as clues to interpreting the graphic representations. In addition, the lack of understanding of abstract graphic symbols continues in this conception and their interpretations are made on limited life experiences. This often leads to sophisticated concepts, such as GNP, being interpreted on the basis of the purchase of ice-creams, as will be seen later in this description.

A very clear example of this conception is the case of the student who makes a series of guesses about the meaning of the Population density map based on the use of colour to depict the population data being represented. She moves from describing the map as portraying climatic regions, and the age of the countries before she reads the title and considers something approaching a correct interpretation. Her description is an example of an intuitive, but inaccurate, response to the use of colour to represent spatial information. Interestingly, the student does consider the colours in a conventional way. The only evidence of logic occurs in considering the darker colours as the more important ones.

29(1-2) Well, that's how much desert land, and the orange would have a bit of grass and all that, the red would have more grass and probably the dark brown would have the most grassiest places...... They could also mean another thing. Sort of, the light, the yellow means its the newest bit of the country, the light orange its sort of new. The dark red, the dark orange, its older, the red, its getting very old, and the dark brown its the oldest.

Similar kinds of misunderstandings occur when this student examines the Age Distribution Pyramids. The data are seen to depict attributes of the countries themselves rather than of their people. Thus, the ages being represented are those of the countries. This misunderstanding may be interpreted as relating to the student's inability to understand the purpose of the map:

29(5) Interviewer: What's this one telling about?
How old they are... Agnien is probably...from about seventy years old, and that's how many years they've lived.
Interviewer: who's lived?
Agnien...the country's lived.

For this student, gender also becomes an attribute of the countries:
It tells you whether its a male or female. And the lighter spots is the female, and the darker spot is the male.

Experiencing the Population Density map as representing climatic regions is common amongst the youngest students interviewed. The inability of these students to

understand basic geographical concepts reflects the limited development of their knowledge base. Any superficial understanding is derived from personal experience and a focus on the colours used. A strong consideration of the emotive nature of the colours pervades any interpretation. Thus, Daseland is declared to be a hot place because of the proportion of the country coloured red:

30(23-24) I don't think I'd like to live in Daseland....it would be too much desert, too hot and everything.
Interviewer: So is there a reason why you think that's a hot area?
Oh, because red usually means hot. (Bovenesia is) not as hot as this place.
Interviewer: So, why is Daseland hotter than Bovenesia?
Because its got more red.

This conception is not restricted to the youngest students interviewed. Older students, also, interpret the maps and charts on the basis of isolated features of the map rather than an interpretation of the whole; that is, isolated features or areas of the maps and charts become figural. An older student, for example, is unable to deal with the Birth and Death Rates Map as such because the symbols used distract him from the intended meaning. Although this older student is aware of the problem it remains a barrier preventing him from experiencing the map appropriately:

15(3) This one doesn't really tell me much at all, I can't really interpret that one.....I keep thinking that these are cities.....I thought that might have had a big city (Esoria large red dot) and a small city (Esoria small black dot).

Another example of this conception is evident where the GNP chart is viewed as a representation of inflation over time. Here the student has a knowledge of more challenging concepts, but relating this knowledge to the graphic representation of GNP per capita for the GRAK countries was too difficult a task. When asked about the meaning of the chart the student replies:

21(2) How much the money has gone up, for goods and things.
Interviewer: Could you tell me more about that?
Say, an iceblock used to be twenty cents, now if it went up like this (as in Agnien and Daseland), it could be one dollar now. But in the others (Esoria and Catonien) it would still be twenty cents.

The earlier examples demonstrate how in this conception the nature of a map/chart is better understood and yet misunderstandings continue to result from lack of attention to titles, focussing on specific symbols in isolation. Poor linguistic skills, that is the inability to read or understand the significance of the title, can also be linked to this way of experiencing the map. One of the younger children , who does not understand the meaning of *import* and *export*, decides that the trade map indicates how important the countries are (imports) and the extent to which the inhabitants dislike the countries (exports). Looking at the trade map, she describes it as showing;

29(16) How much importance they've got. That's (Daseland) probably the most importance, probably Catonien has got least important...
Interviewer: What do you think importance might mean?
How important the countries are. And exports would probably mean how much people don't like the countries, and how...they don't have very much importance.

In another example a student 25 (13-14) reads the title of the Export Pies and describes the meaning of export. However, when describing the chart he very quickly

reverts to describing it in terms of 'how much the countries have', to the extent that when he is next asked to say what the chart is about he replies:

> 25 (14) well, its trying to say how many different kinds of products the countries have got.

In one instance this conception was found 'embedded' in more sophisticated conception. The student was using a map (the Birth Death Rates map) and a chart (the Export Pie charts) to describe the countries. His lack of attention to the title of the chart led him to experience it as another form of Distribution of Production Chart:

> 5(4) Daseland, ...they've got high industrial production, very low birth rate, high death rate....Esoria's high agricultural level, so there'd be a lot of people way out in the country. Agnien, low birth rate.....pretty high industrial production.

Conception three: Graphics are seen as Partially Interpreted Macro Representations.

In this conception the maps and charts are seen as representing data at country scale. Students experience the intended meaning of the map/chart at an overgeneralised macro level; that is, they recognise the map as portraying population density for example, but they do not, however, interpret the data about population density correctly across the graphic. Essentially, the students appreciate the purpose of the graphic but they do not understand key specific details represented in it. Aspects of the presentation of the data are not understood, that is they experience partially accurate representations of the data at a localised level. As a general rule, the maps and charts continue to be read serially.

In this conception the life-world which the students are drawing on shifts between 'nonsense' and 'realistic fantasy'. For example, the students no longer describe the dark zones of the pie charts as representing areas of the country covered in oil, but they will continue to fantasise to varying degrees. One child claims to be interpreting the maps by trying to imagine what it would be like to live there leading to a description of herself being in the various countries experiencing the different levels of population density:

> 32(27) Well, you imagine that you're there....say you're in the brown, well you imagine you're there, and there's a crowd in that part because there's lots of people.

Another student's description of Esoria is based on her understanding of an underdeveloped country:

> 28(7) ....with Esoria they maybe poor but they may have a few hospitals, places like that'

She goes on to attribute the lack of an elderly group to 'lack of manners' on the part of the younger inhabitants.

Students experiencing the maps and charts in this way are usually interested in discrete elements of the data rather then searching for petterns in the data. They are describing discrete portions of the map or chart. Essentially the student is looking at selected parts of the individual graphics, neither comparing them with other parts of the map/chart nor with other maps/charts in the set. This represents a very narrow interpretation of the quantitative data on the graphics. It is associated with an

underdeveloped knowledge base.

The following student's response to the population density map provides an example. He recognises the population density map as telling about how many people there are in the countries, and reads the key to interpret the different colours. However, the various sections of the map are treated separately and the concept of population density is not understood well:

11(1) Well, in Agnien, there's most of the area is filled with 301-1,500 people. And the other parts is 1,501-2000. And then this area just here is filled with 11-100. And B, is mainly filled by 301-1,500. Across there's a section where its 2001 -3,500.

This student also has difficulty deciding about the nature of the numbers being represented, i.e. he did not possess a clear conceptual understanding of the term 'population density'. When asked whether numbers tell about the number of people in the whole area he decides that the numbers represent millions:

11(1) Million....and Catonien is filled up by zero to ten million.

Another common example representing this conception occurs with the Birth and Death Rates Map. Most students, other than the youngest understand the intention of the map to indicate birth and death rates. The circles of different sizes, however, were interpreted without recourse to the legend. This is exhibited particularly in students' assumption that Birth and Death rates are identical in Agnien and Bovenesia, and the Death rate is higher than the birth rate in Daseland:

17(4) But here, (Daseland), there's more people dying than there is giving birth.

36(8) Well, A and B have about the same...the death rate and the birth rate are approximately the same, so they'd have, the population would stay approximately the same. And Daseland, it would decrease a little....

A somewhat more naive variation of this conception occurs in the following two cases where the students clearly understand the intent of the charts but do not have a suffmciently sophisticated understanding of symbology to interpret them accurately. In the first case a child describes the red dots$as representing 'when the mummies have babies'. Although she understands that the map is portraying birth and death rates, the symbology of the map leads her to experience the circles as denoting the geographic boundaries of where the babies are born. When asked to tell how many babies the mummies have, she replies:

32(8) Fifty-one babies are born in this one dot. Forty-one babies are born in that dot, twenty there and thirty there.

This student is also experiencing difficulty with the nature of the statistics being represented. The range of numbers represented by each symbol is simply glossed over.

Although varying in sophistication, both the above examples demonstrate experiences based on misinterpreting the symbology on the maps.

Another example is that of a student who identifies the Trade Map as indicating who 'they export and import to'. He finds the details of the map difficult to interpret because the various lines are confusing:

21(4) All the lines there are a bit confusing to me....You can't really see it as well.

Charts also are experienced in this way. The Distribution of Production chart is often read as displaying 'amounts' rather than ratios. Thus, students will interpret the charts as indicating that Esoria is producing more agriculture than the other countries, and that Agnien and Daseland, for example, are producing little in the way of agriculture:

21(7) They're (Esoria) doing more agriculture. But the others, they're not doing much agriculture at all.

25(11) On this, Agnien........there's a lot of services, not as much industry and mining, then there's not very much agriculture. (13) Well say, if we took the agriculture...and if we went to Agnien its dropped. Its dropped right down to here, so lots of agriculture has like, gone.

Category Four: Graphics are seen as Prtraying Localised Patterns

In this conception the map or chart is seen as portraying patterns which are generated by the data. The students focus on a part of a map or chart at a national level and identify spatial patterns which allow them to make inferences about the nature of the country being depicted, usually in terms of the socio-economic status of that country. Students are no longer reading the maps and charts serially, however their focus is usually on no more than two maps at time. Any comparisons between countries are made on the basis of a single map or chart. However, they clearly understand the meaning of the titles of the maps and charts and the concepts dealt with, although more difficult concepts such as Gross National Product. Their understanding of abstract symbols is better developed allowing them to focus on patterns as will be seen in the following description.

In this conception students are also drawing on a more sophisticated view of the world around them, but comparisons made continue to be based on the familiarity of their own country, and are not always accurate. One student talks about what it would be like to live in Bovenesia on the basis of his perception of Australia:

15(10) It would be a very sort of, middle class life. You wouldn't have the most power...You'd just sort of be a bit like Australia, where you get in between the third world and...the really powerful nations. But still you're having a pretty good life.

An illustration of this conception occurs when students relate the shapes of the age distribution charts with particular types of economies. A 'barrel-shaped' population chart, therefore, is understood as representing an industrialised country in which the birth rate is declining:

8:2(p1)...Agnien's age distribution is...its population is like a barrel shape which indicates that it is industrialised and that its birth rate is declining. And also that people are living to longer ages than they have been in the past.

In this conception students begin to use more than one map/chart simultaneously. The graphics are spread across the table and examined at will rather than being read serially. Students experiencing the maps and charts in this way may well be reading across them, using all of them; however they tend to focus on one country at a time. Thus the student from whom the above quote was taken described each country in turn but made limited comparisons between countries whilst doing so. There is, however, evidence of limited comparison between countries from some students, where this happens the comparison usually takes place on the basis of a single map,

or at the most two maps or chart:

20:2(p1-2) Referring to the Age Distribution chart: And in Esoria it's like Catonien, there's a lot of children; and then the older the people get the less there are... they both look almost the same, because they both got around the same percentage for young children, and then it tapers off a bit as you go up.

Students experiencing the maps and charts in this way are reacting to the patterns generated by the data, but they are not actually reading the numeric data from the maps. Reading the maps and charts in terms of patterns is, for example, revealed in the use of terms such as 'more' and 'less', describing the patterns of shading on the population density map and the shapes on the age distribution charts. For these students, essentially the patterns generated by the data become figural and the numeric data itself fades into the background. One student describes both the population density map and the export pie charts in this way:

20:1 Well these are probably the biggest of the countries and there's a lot of people in here, but less through here and here, very few people in here (page 4)...A is producing a lot more industrial products, and a lot less of oils minerals and metals... B, again a lot more industrial products, and less agricultural products...

Experiencing the data in this way usually results in accurate readings of the data if the student refers to the legends provided. For example, in the following discussion of the Population Density and Birth and Death Rate maps the student points to the importance of the legend in correctly interpreting them:

18:17(p1) For example, this one I just looked at it, and saw very dark areas there, so I just went to that (legend), and could see that they have a great population density..... This one (Birth Death Rates), as I said before, is pretty confusing with the different size dots meaning different things. So that one wasn't very clear...you need the legend very much in that.

It is noticeable that the students using this conception do not read the numeric data, their focus is rather on the meaning as they experience it as encapsulated in the pattern; therefore a 'great population density' is referred to rather than a population density of x people per square kilometre.

Another student describes the pattern generated by$the population chart, treating each country in turn. The countries are not compared, other than to say that they are all different:

13:1(p2)...Daseland has got a lot more population around the West and not so much around the East....up here (Bovenesia), it's got most down the South, and probably average up in the north....And country Esoria is pretty much all the same apart from the North East...and this country here (Agnien) is nearly the same all around.

Misinterpretation of the intended meaning of the maps and charts occurs if the patterns are the focus at the expense of the legends. Not only is the data misread but the students' inferences about the countries are misleading. Thus a student who depends entirely on the patterns in the Birth Death Rate chart describes Daseland, an advanced industrial nation, as 'going backwards':

1:3(p5)..this country, Daseland, it seems to be going backwards, I mean you can't sustain a country that has a higher death rate than it does a birth rate.

Misinterpretations also occur where students' lived experience is limited, and their corresponding understanding of socio-economic trends is clearly coloured by this experience. An example of this is found where a student identifies a pyramid-shaped population chart as representing a wealthy nation because there are seen to be few old people to support and$many young people to work to ensure the country's wealth. The age distribution chart is read at the pattern level; the student experiences them as a series of patterns of proportions of young, middle-aged and old people. He is nevertheless unable to make a correct interpretation about the countries because he considers the proportion of children being born in Catonien and Esoria to represent wealth:

1:1(p3)...maybe if the country or province is going very well such as this one (Catonien) at$the moment people may be having more babies. They may be able to afford it better, they can have more babies, and that's the same with Esoria down here.

Similarly, another student associates high industrialisation and low birth rates with less developed countries:

5:4(p4) Daseland would be a third world country, because they've got high industrial production, very low birth rate, high death rate. Probably not very...more interested in making money than interested in the people.

When these students change their ways of experiencing the maps and charts (that is they shift focus), a change in understanding (interpreted meaning) also occurs. In both cases widening the focus of their interpretations to include other maps and charts whilst seeking consistency of meaning impacts on understanding. The following quote provides an example:

5:11(p2) Well, I based what I said about Daseland and Agnien being third world countries on their industrial troduction being high, and their birth and death rates...then again if their Gross National Product is that high then they can't be third world countries, so I was wrong there.

The outcomes of this conception are discrete pictures of individual countries, rather than a broad understanding of the GRAK world.

Category Five: Graphics are seen as Representing Comparative Small Scale Relationships

In this conception the maps and charts are seen as depicting relationships between the countries in terms of how they trade and interact with one another, as well as depicting similarities and differences between the countries. Students' focus on the relationships/similarities and differences between the countries leads them to make comparisons generating a broader picture of the world rather than interpretations of individual countries. In order to do this students often make multiple use of graphics, comparing across groups of the maps and charts. Their interpretations continue to be made on the basis of their own country, Australia, and its relation to other nations. Their ability to comprehend abstract symbology is sound and reflects a realistic understanding of geographical concepts.

This is demonstrated in one student's discussion of administrative regions and trade patterns in which the provincial areas are related to the pattern of trade for

general comparative purposes:

> *1:1 (p1-2)...it appears that some of these are connected by borders and others by trade....the different provinces are not independent, they seem to trade with other nations and they need that, or for just everything to run smoothly because they may not be able to produce certain things in their own province.*

Interestingly, the student who is here experiencing the maps and charts in terms of the relationships between the countries, experiences a shift in figure-ground relations from the geography of the GRAK world to the data represented which makes this conception possible. Whilst looking at the population density map his discussion began:

> *1:1(p1) It seems that the GRAK world is centred eround the sea, the Moria sea, and this may mean that fishing comes into their daily lives...'*

The same student compares the countries on the GNP chart. His focus in the following extract is on Daseland and Agnien:

> *1:5(p4) They're obviously two of the more wealthy provinces out of the rest.*

In each of these statements the students seek general, rather than finely detailed, comparisons. This indicates that the holders of this conception are transitional in the extent to which they are able to interpret the range of socio-economic data about the GRAK world. The ability to extrapolate beyond the data first emerges in this conception. In this instance the sophistication of the extrapolation is limited:

> *1:5(p4) And they've got a bright future ahead of them, because they're still going on the up... Bovenesia, its heading on the up as well... And these countries seem to be going nowhere (Catonien , Esoria), maybe they've got to start producing more goods in their own country.*

A variation of this conception occurs when a student describes similar countries as being virtually a single unit. The attempt at comparing two countries is evident, but it is associated with an attempt to generalise about similar characteristics between the two countries:

> *20:5(p3) Well, these two here (Catonien and Esoria), they're virtually like one country anyway because they've both got similar things, they've both got a lot of children in that area (Age Distribution chart)... and Agnien and Daseland, I suppose you could say that they look a little similar.*

This way of experiencing the maps and charts is reinforced in the same student's description of the GNP chart:

> *20:6(p1) Yep, it shows up here again, Daseland and Agnien are doing the best, Esoria and Catonien are similar, but C did a little bit better around 1965, but then Bovenesia has, is gradually improving as the years go by, since about 1965 they've gone up.*

In this conception students make multiple use of the maps and charts, and, dealing with several of them simultaneously, compare them to build a picture of the countries. Many of the students are also able to look beyond the general patterns to the specific data. They are familiar with the purpose and symbology of the maps and charts to be able to focus on the data in interpreting the countries:

> *1:8(p3) Catonien seems to be not very well populated...in the middle the terrain might be harsh, I'm not sure. There's zero to ten people per square*

kilometre... about 30% are services I think we said before...it seems to be not as well off as these two countries (Agnien and Daseland).

The students continue, however, to relate their understanding of the countries to familiar perspectives of the world. Catonien, therefore, is related to an Australian mining town:

1:8(p3) So they rely a bit on industry and mining in their country, that would be like in Mount Isa where they rely on industry and mining.

Another student similarly related Daseland and Agnien to the United States whilst comparing the countries in terms of the population and Trade maps:

20:5(p2) Daseland's probably the biggest one, in people and in exports, a bit like America. But when you get down to the smaller ones, which don't have as much people, they only import and export a bit.

However, as in Category Four, inadequate understandings of socio-economic trends may lead to inaccurate interpretations. Thus, one student explains the differences in population density in terms of migration between countries:

12:1(p1) looks as though Catonien doesn't have many people, although over here its got a large birth rate, so it looks as though lots of people have moved to Daseland, because its got a small birth rate but its very dense.

Category Six: Graphics are seen as Representing Sophisticated Spatial Representations.

This category is qualitatively different from category Five in that the maps and charts are used as sources of evidence to support or refute particular understandings of the world which have been developed by the students. It is accepted that the maps and charts should collectively provide a coherent picture, therefore any apparent anomalies require new interpretations or understandings to be developed. In this conception, a wide range of the maps and charts are considered at any point in the student's discussion.

In this conception, it is neither the maps nor the data which are figural for the student. Rather, the interpretations which they derive from the data are the focus of their consciousness; these interpretations are then successively matched against the data for support. The conception, therefore, goes beyond searching for similarities and differences between the countries to ensuring that the other maps and charts support the interpretation being made. It seeks to develop a constructive synthesis of current trends using the full range of data. For example, one student refers to almost all the maps and charts in supporting her claim that Catonien and Esoria are 'developing nations':

37:1(p2) ...they've got a high birth rate (Age Distr Chart) and also a high death rate (Age Distr Chart and Birth Death Rate Map).....The more developed ones have produced a lot of industrial products (Dist of Prod and Export Pies). For exports... the developing nations have a much reduced amount of industrial products leaving the country.... And since they're not producing as much (waves hand over to GNP Chart) they have a very low GNP rate.

Another student is aware of how he is using the maps to support one another to provide a more detailed interpretation of countries in the GRAK world. His comments focus on the multiple use of the data to permit the development of a deeper

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understanding of the data:

> *4:3(p2) Sometimes there can be a lot of ideas that you have of why, say they have a large population group that is young (in Age Distribution chart)...but it helps if you've got information to back that up, such as here (Birth Death Rate chart).*

Clearly, this conception involves the extensive use and reuse of a range of maps and charts, and coalescing of the outcomes from these investigations to produce a synthesised generalisation. When the maps and charts are used in this way, one or more maps and charts may be reinterpreted in the light of others, usually leading to an enhanced understanding of the data. One student reconstructs his own understanding of 'third world' countries using this process:

> *1:2(p3) ...originally I thought that these countries (Agnien/Daseland) maybe having hard times because they are not having as many babies...they can't afford it. I would have thought that Catonien here would have been going fairly well; because the country would be in good shape they'd be able to afford babies. But according to this one here (GNP chart)...it would appear that the third world countries are having more babies...*

The process of comparing data on the different maps for consistency is also described by a student reflecting on her experience of the data. This is a form of triangulation across the data to ensure that consistency of interpretation is maintained:

> *40:9(p2) Well, for starters I took the social, what I call the social maps, and put them in a pile...And then I took economic sort of based maps and put them in a pile, and then looked at them individually, looked at them in a group, to see if the figures are similar in that economic group for example. If..from what we've learned,...if there are generally a higher secondary sector, and a high tertiary sector, there's going to be greater GNP... Then you have a look at the GNP.*

A range of charts is also utilised by a student exploring the development of Bovenesia. She uses the GNP, Distribution of Production and Export Pie charts:

> *37:22(p3) We could use these three (charts)... to see the development, especially of Bovenesia...the growth of industry is also a point of development, and also here we can see a reduction in agriculture...*

What is figural in this conception are the generalised interpretations generated by the student from the data which are then successively matched against the data for support and/or confirmation.

The way of experiencing the maps and charts remains static. That is the students are looking at the maps and charts as they are represented and not attempting to move beyond the data. Future developments and extrapolated trends in the GRAK world are not contemplated.

Category Seven: Graphics are seen as the Basis for Extrapolation, Reflection and Prediction

In this conception the maps and charts are seen as displaying data which represent aspects of the countries portrayed at particular points in time. Students go beyond describing the countries as presented in the maps to interpreting the socio-economic development of the countries over a period of time that extends beyond that given

on the graphics. Extrapolation and prediction are thus important elements in this conception, allowing the students to interpret social and economic trends in the GRAK world far more powerfully.

This conception is exemplified in one student's description of the progress of the countries in relation to the GNP chart. The comparative wealth of the countries is related to the likelihood of 'progress':

37:3(p1-2) And area Bovenesia has just become a developing nation, because here we can see that up to 1970, they had a fairly static GNP rate; but then it started rising, and possibly in the future will reach that of the other two..... (GNP) would signify the average wealth of the countries. If there's a high monetary status in... Daseland and Agnien, then possibly it would be a wealthier nation. Although the division of wealth may not be equal, its still more developed and there's a possibility of more progress...

In this conception the future development of Bovenesia is described in terms of industrial and technological development and improved cash flows. This reflects the student's advanced conceptual knowledge and ability to project this understanding in a reasoned predictive statement:

35:9(p2): (Bovenesia) is still taking off....it will grow as ...industry will develop more and more, as more technology is building...and there is a better flow of cash; and therefore there will be a better, an increase in the GNP.

The use of patterns, comparisons and seeking supporting evidence from a range of maps and charts continue to be important in the development of reasoned, predictive generalisations. Therefore, students utilising this conception may continue to fall into some of the interpretive traps which accompany the earlier conceptions, for example continuing to read patterns whilst disregarding legends provided (see Category four). Thus, the following student recognises that the population maps and charts represent data gathered at a particular point in time, a critical aspect of this conception:

1:3(p2) ...if I had the different years, I'd be able to tell. I'd have a better idea, but looking at this... see this is just for one year.

Nevertheless, he continues to misread the Birth and Death Rates map. Therefore, his assumption about the declining population in Daseland, based on concluding that its death rate is larger than its birth rate, produces the following predictive statement about this nation, which is at odds with the information provided on the GNP chart:

1:3(p1)...its just going backwards... So in future years to come they may not be as powerful as they are at the moment.

Unfortunately, the presence of this conception in the data is somewhat fragmentary, making it difficult to piece together as extensive a description from students' discourse as has been possible in the other categories. The conception was primarily recognisable in the data through extended synthesis which incorporated prediction as has already been described.

Discussion

The outcome space that has emerged in this study indicates distinctive structural variations in the students' experience of graphic representations of quantitative information in terms of what they experienced and how the students actually experienced the range of graphics about the imaginary GRAK world. What was

represented as a coherent distribution of countries each characterised by a distinctive mix of socio-cultural variables that were portrayed on seven maps and graphs, was experienced with varying degrees of accuracy by the students. Initially, one might conclude that what the students observed on these maps were varying amounts of geographical information. The amount of information that the students discerned varied in proportion to the extent to which students could interpret abstract graphic symbols. In reality, this is a superficial interpretation of these variations in conception. At a deeper level, these variations in the geographical information understood, relate closely to students' understanding of geographical concepts. This is evidenced by the degree to which the students understood geographical concepts such as population density, patterns of trade and the distribution of areas such as countries. This supports Ottoson's claim (1988) that the central difficulty in the basic understanding of maps lies in the conception of the spatial relationships between the objects of the maps.

How the students actually constructed their experiences further exemplifies the extent of variation that occurred in their interaction with the graphics. The ability of some students to work with a few graphics separately contrasted dramatically with those students who dealt with multiples of graphics simultaneously. No doubt, there were quite large differences in the students' desire and ability to handle differing amounts of graphic information. We can also conclude that the ability to handle differing amounts of quantified graphic information is related to the production of deeper understanding of this data.

When the aspects of what the students saw on the graphics are combined with how they used the graphics, a set of variations emerge which constitute the qualitatively different ways in which students encounter graphic representations of quantitative data. These variations, characterised in the seven categories of description, provide a useful basis for developing a series of didactical implications for both teachers and teacher educators. These may include the following:

1. All graphics should include precise statements of purpose, i.e. accurate titles, to convey the intended figure on the map or graph. However, the presence of such titles will not guarantee that students will comprehend the title and consequently the purpose of each graphic. The chances for such understanding occurring extend beyond a statement of words to include the use of symbols that can be understood by the graphic user. This means that the use of abstract symbols should be minimised when the map users are unable to decode them sensibly. If the symbols resemble their referents then there is likely to be a chance that the students will relate symbols and the intended purposes of the graphics and derive some useful meaning from the graphics.

2. The learning of knowledge that is presented in graphic forms will vary depending on the extent to which the learners are able to work with the whole graphic or parts of it. If the learner is able only to work with parts of a graphic such as a map, it is unrealistic to focus on their development of spatial patterns. Rather, the focus of the learning should be on relatively simpler tasks such as relative location and the recognition of features from symbols. Where the learner can work confidently and competently with whole graphics, the tasks should be more demanding and they should incorporate the breadth of information that has been represented on the graphic, e.g. the economic production of a range of countries rather than that for a single country.

3. Educators should build upon the students' personal experiences when they want the students to use graphically-represented data effectively in learning situations. Whether the graphic represents data from a real-world situation or an imaginary one, there is a strong probability that the learners will place a strong reliance on situations and experiences from their own life-world to the graphic interpretation. There may be variation in the way that this experience is reported when the learner expresses his or her personal experience, ranging from seemingly unrelated, nonsensical statements through to strongly developed relevant conceptualised statements. However, all of these personal experiential references reflect the importance of the individual experiences to the graphic learning context. This captures the relational role between people and graphics in different life-world experiences.

4. Educators should choose activities for learners in reading graphics which incorporate three levels of human activity that are defined by the operations involved in the graphic interpretation task, the goal of interpretive task and its emerging force, i.e. how the activity of graphic interpretation is related to the motive for reading graphics that are based on quantitative data. As Lave, Murtaugh and de la Rocha have claimed earlier, meaning may be derived from graphic interpretation of the relations between the above-mentioned three levels of activity and the action of conducting a number of graphic interpretations.

5. The contexts of the content of the graphics used in learning tasks should match those of the students engaged in the learning situation. The context cannot be separated from the actual reading task(s). In this study the global context was the basis for the data about the GRAK world. Students who possess an understanding of the global socio-cultural context will draw on this understanding in their interpretive experience, through their knowledge of key concepts, e.g. economic development and population density, and their understanding of regional interactions through such enterprises as trade. The students in this study come from an industrialised context in which activities such as trade, manufacturing and statistical computations such as Gross National Product are commonplace. Therefore, these learners would not be expected to be hindered socially or culturally by encountering them in these graphic interpretive experiences. Such may not be the case in a different cultural context.

6. Teachers need to find strategies for changing their student's ways of experiencing graphics in a wholistic way, consistent with the framework of this study. The categories of description provide the basis from which to devise teaching-learning strategies which change learners experience of graphics. Familiarity with the categories should allow teachers to identify what conceptions their students are drawing on in particular contexts. In the case of older students, exposure to the categories may allow students to become aware of their own strategies and the possibility of adopting alternatives. The categories also provide the information for effecting the required changes in interpreting graphics as they describe not only 'what' is experienced but also 'how' that experience comes about. Specifically, the categories specify what aspects of the graphics the students focus on in each conception. The major challenge for teachers then is to find strategies for achieving the desired focus. These, and other strategies for teaching and learning graphics derived from this study will be the focus of further research.

The pursuit of such didactical implications offer educators some guidance in the selection, design and use of graphics in the learning experiences which they develop for different types of learners. If this study does nothing else, it will alert educators

that the learners with whom they interact are unlikely to address the graphic interpretive experience in the same way and that the extent to which the intended message is derived from each graphic will vary considerably. A picture may be worth a thousand words, but how many of these words are retrieved by each user depends on the experiential baggage brought that he or she brings to the situation of the graphic interpretation and the cultural context in which the situation is placed.

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A CONTROLLED EXPERIMENT
ON TEACHING GEOGRAPHIC MAP SKILLS

Shimshon Livni, Orah Livni, Varda Bar

1. Based on the topographic height concept

Abstract

The present research study concerned with initiating, planning and developing a new unit for teaching mapping skills in Grade 4 of the elementary school in Israel.

At the initial stage three official syllabi and four most widespread textbooks in the school use were examined. The achievements of about 300 pupils who had learned the mapping skills according to the former program were evaluated. As a result of our findings two basic questions have arisen:

a) what are the cognitive abilities required for reading the map as the perpendicular projection of the environment and for encoding and decoding the three dimensional landform from a two dimensional physical map?

b) what proportion of the 9 to 10 - years old pupils possess the required entry-abilities before they start learning the mapping skills?

In order to answer these two questions a pilot-study was conducted in 1987. About one hundred 8 to 12 - years old children were given Piagetian Task Tests. The conclusions of the pilot-study were as follows:

I. In order to see the map as perpendicular projection of the environment the child has to be able to master a decentric perpendicular viewpoint.
    In order to encode and decode the three dimensional landform, cognitive skills of the projective and Euclidian space are needed.

II. The majority of pupils in grade 4 master the motoric representation of the decentric perpendicular projection and of the projective and Euclidian space skills. But only a minority of them master the symboled representation of these cognitive skills.

Based on the findings of the previous studies and the conclusions of the initiating stage a new teaching unit was developed.

This teaching unit focussed mainly on teaching mapping skills connected with seeing the map as representing a perpendicular projection of the environment as well as encoding and decoding the three dimensional landform into and from the physical map.

The unit was based on the recognition that it is necessary to overcome the existing gap between the formal cartographic thinking and the concrete thinking of the learners. This recognition directed the choice of topics, their organization in sequence and the didactic method. By this method is an application of the constructivist approach to science teaching in schools. This approach suggests to give the pupil a learning situation that considers his/her previous conceptions, his/her

developing cognitive abilities and facilitates his/her motivation. The learning materials of the unit include the pupil's workbook and teaching aids. The unit, its materials and didactic method were evaluated in controlled teaching experiment (1988).

About eighty pupils grade 4 from two schools participated in this experiment. Half of the pupils consisted of experimental group and the other half was the control group. This experiment took place as a "quasi-experimental design". The participants' mastery level of the needed cognitive skills was tested before and after the learning. At the end of the school year the of both the experimental and control groups were evaluated.

The conclusions of the controlled experiment were as follows:

A. The experimental group which studied according to the new unit had achieved full mastery of the cognitive skills associated with the learned mapping skills.

B. The experimental group achieved a satisfactory level of mapping skills.

C. Formative evaluation system helped to improve the new unit, its learning materials and the didactic method.

D. Summative evaluation (the final test) pointed at the effectiveness of teaching the new unit.

E. In order to improve teaching mapping skills in grade 4 of the elementary school it is recommended to apply the new unit to a network of implementation research.

2. To preservice teachers and learning disabled students

Abstract

During the year 1992, a controlled experiment in instructing mapping skills to a group of preservice teachers, as well as their pupils, that consistent of a group learning disabled children was performed in Beer Sheva.

The aims of this investigation were as follows:

a. The adaptation of learning unit on mapping skills to a population of learning disabled students.

b. The improvement of the ability of the preservice students to anticipate the learning difficulties of their pupils.

c. The improvement of the mastery of the preservice students in the mapping skills they taught.

The controlled experiment was performed in three stages:

A. The preservice teachers learned the unit and anticipated the difficulties of their learning disabled students while learning it.

B. The preservice teachers taught the unit in a one to one tutorial method.

C. Both tutors and tutees were tested. Their mastery of the mapping skills contained in the unit was checked.

Finding showed that preservice teachers indeed improved their ability to operate cartographic notions and mapping skills, they also improved their ability to define the learning difficulties of their pupils. The learning disabled students of the controlled experiment showed acceptable achievements in motoric representation of the mapping skills, but they were still poor in their mastery the symboled representation of these mapping skills.

We conclude that this mapping skills unit can be taught in classes of learning disabled pupils in two terms:
I. The learning disabled students possess the required cognitive entry-abilities before they start learning mapping skills.
II. The teaching methods will be modified to fit the special needs of these pupils.

TOPOGRAPHICAL MAPS AS TEACHING AID
AN ELEMENTARY APPROACH AT SECONDARY LEVEL

Theo Smit

1. Introduction

The key to the successful teaching of Geography entails creating effective learning experiences and imposing a sense of reality in every teaching situation. Topographical maps can be used to facilitate these goals. Spatial relationships and interaction of various phenomena could be related to concepts in the syllabus/textbook favouring a more problem-orientated approach where students could gain insight into the process of decision-making by means of actual participation during the lesson where the topographical map is used as a vehicle to explain concepts.

Effective use enables students to develop intellectual skills and abilities, promoting geographic skills and the proficiency of applying these skills. The primary goal is to develop students perception to recognise spatial patterns, spatial relationships and spatial interaction and become aware of the processes which act upon these patterns and relationships which bring about change.

As teaching aid, great emphasis is placed on very thorough didactical preparation by the teacher as he/she must guide the student by means of elementary but thought provoking goal-directed questions to read, understand and integrate phenomena represented on the topographical map with the concept being taught and explained. Students must grasp the significance of the situation in order to generate effective learning experiences.

Once the ability to read a map has been mastered by the student, analysis and inperpretation follows, i.e. the student's geographical knowledge should enable him/her to analyse and interpret the significance of features represented on the map.

A very elementary model has been developed. Obviously many approaches exist, however, I support a model which is simple yet effective, within the scope of the student's reference frame.

The primary goal of this model is to develop a student's perception to:

– observe and recognise the relationship that exist between people and their environment;
– identify spatial patterns, - relationships and
  - interaction; and
– be aware of the underlying process which act upon spatial patterns and relationships which bring about change.

2. Topographical maps as teaching aid: syllabus application

As teaching aid these maps can be applied very easily with various sections of the senior secondary phase. In standard 8 (15 year olds) they can be used to explain concepts relating to geomorphology involving internal forces and resultant landforms

such as mountain building. In standard 9 (16 year olds), micro climates (valley climates), geomorphology (erosion by running water, ice and wind and resultant landforms) and economic geography (primary, secondary and tertiary activities) and in standard 10 (17 to 18 year olds), micro and city climates, geomorphology (drainage basins), ecosystems (impact of man on the environment) and settlement geography (rural and urban settlement) are relevant concepts.

As previously mentioned, the primary aim of using a topographical map is to develop student's geoqraphical skills. They must be able to observe and recognise spatial patterns represented by the map situation. Of paramount importance however, is to relate these patterns to spatial relationships and interaction thereby recognising the significant role of man in the environment.

It is important to note that the map situation is used as a point of departure in the learning process. This approach will enhance a sense of reality and facilitate effective learning experiences whereby students are exposed and guided to apply theoretical knowledge.

3. Some basic skills required when using the model

The ability to analyse and interpret a topographical map, includes those skills to which a student is introduced at standard 6 level (13 year olds).
These skills refer to:

Knowledge of mapwork techniques
This includes the ability to:
- understanding of contours and landforms they represent;
- measure and calculate distances and areas;
- location of features and objects;
- orientation on the map to determine direction and bearing;
- calculate vertical exageration and gradients;
- determine intervisibility.

Knowledge of map analysis techniques
- the reading of conventional symbols and the ability to relate them with concepts represented on the map;
- identification and description of the spatial distribution of physical and cultural phenomena.

Map interpretation
The ability to explain the phenomena represented on the map. Patterns should be identified and described and the relationship between these patterns, aspects and features explained. This ability requires thorough theoretical knowledge of relevant concepts relating to Micro Climates, Geomorphology, Settlement and Economic Geography and the ability to apply concepts thereof to the map situation.

4. Model to read, analyse and interpret a topographical map

In order to facilitate effective and meaningful map reading and understanding, and elementary model has been developed to aid both student and teacher. Obviously many approaches exist which vary in complexity - but one should take cognisance of the fact that pre-tertiary and not post graduate students are involved. Therefore I support a model which is within the scope of the student, who is, in the end, the user thereof.

The model, which can also be referred to as a "checklist" to organise a logical approach and set modus operandi, consists of two integrated sections.

The first concerns the compilation of a sketch map of the area represented by the map. Secondly, while compiling the sketch map, a check list of physical and cultural features are provided which will also aid in the compilation thereof.

It will simultaneously provide a framework to "read" the most important features on the map.

This check list involves the following basic physical and human geographical features (see attached model):

- Relief
- Drainage
- Infrastructure
- Economics (Primary, Secondary and Tertiary activities
- Settlement (Rural and Urban)

A very basic framework is provided to read and compile a sketch map. Physical and cultural phenomena are dealt with seperately. Each classification is supported by basic concepts defined as features. In addition, each feature is provided with certain characteristics which are usually evident on topographical maps. The main purpose of this framework is to provide students with a source of reference. The main features and characteristics should be used as an index while compiling a sketch map, focusing on spatial patterns.

However, while "reading" the map, students should also be made aware of spatial relations and interactions. Students should be able to analyse and interpret phenomena represented by conventional symbols by answering goal-directed questions such as "what", "where", "why" and "how". Each phenomenon represented by means of a conventional symbol, is supported in the framework by a number of typical characteristics. The phenomena and characteristics have been identified and are based on the senior secondary phase syllabus. Consequently these phenomena are, for the purpose of this model, defined as primary activities (farming, forestry and mining), secondary activities (industries) and settlement (rural and urban).

Once the ability to read, analyse and interpret has been mastered, the student's geography knowledge and understanding would enable him/her to grasp the significance of features represented on the map. Of vital importance is the goal-directed questions set by the teacher to lead the student by using open-end questions in this exercise.

5. Conclusion

Using topographical maps effectively requires thorough and meaningful didactical planning. The teacher is initially responsible for guiding the student to read and understand the features presented on the map and relating this to concepts and theoretical knowledge. It is also evident that great emphasis is being placed on explanation rather than description. No teaching aid, how valuable or sophisticated can be of any value if not used effectively by a dedicated and thoroughly prepared goal-directed teacher.

Appendix

MODEL		
to read and compile sketch map		
CLASSIFICATION	FEATURE	CHARACTERISTICS
Physical	Typography	Mountains, hills, plains, valleys
	Drainage	Basin(s), type of river(s), direction of flow, fluvial stage, stream pattern, channel characteristics
Cultural	Infrastructure	Roads (type and direction) Railways (type and direction) Communications (telephone, power supply)
	Economic activities: Primary	Agriculture (cultivated fields, orchards and vineyards)* Stockfarming (cattle, sheep)* Forestry/Plantations Fishing* Mining *Substance or commercial
	Secondary	Light industry Heavy industry (Location and raw materials)
	Tertiary	Services provided
	Settlement: Rural	Type and pattern
	Urban	Morphology Land-use zones

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PRIMARY ACTIVITIES: FARMING AND FORESTRY

Conventional symbol	Farming activity	Possible products	Irrigation system	Type of farming	Characteristics	Favourable factors	Environmental despoilation/conservation
`" " " "` `. . . .`	Cultivated fields	wheat maize sugar	canals weirs furrows pipe lines pumps	subsistance commercial	extensive intensive mechanisation sugar mills service lines	topography water supply power supply roads railway telephone	soil erosion wind erosion windbreakers contour ploughing terraces nature reserves anti-erosion walls
⊢ ⚡ ⌶ `☐ KRAAL`	stock farming	beef dairy wool mutton		subsistance commercial	extensive intensive tannery abattoir dairy sheds	topography water supply power supply roads railway telephone	soil erosion wind erosion windbreaks terraces nature reserves tracks and footpaths anti-erosion walls
`. . . . . . .` `. . . . . . .`	orchards vineyards	fruit grapes	canals weirs furrows pipeline pumps	substance commercial	estates sheds cellars farm size extensive intensive	typography water supply power supply roads railway telephone landing strip	soil erosion wind erosion windbreaks nature reserves contour cultivation terraces anti-erosion walls
shaded green	forestry (woodland)	timber		commercial	commercial extensive firebreak look-out towers saw mills state forests	topography roads power supply	nature reserves hiking trails firebreak conservation areas

⟶ goal-directed questions (what? where? why? how?)

PRIMARY ACTIVITIES: MINING

Conventional symbol	Type of mining	Possible mineral	Characteristics	Transportation Communication	Environmental despoilation conservation
	open cast shaft	coal diamonds. copper etc.	digging mine dump sub siding ground quarry brickworks ventilation shaft colliery compound reduction works service lines conveyer belt power line	railway line service line conveyer belt roads power supply water supply	excavation mine dump terraces anti-erosion wall soil erosion nature reserve wind breaks conservation areas

⟶ goal-directed questions (what? where? why? how?)

SECONDARY ACTIVITIES: INDUSTRIES

Conventional symbol	Secondary activity	Type	Raw material	Location characteristic	Favourable factors	Environmental despoilation
	factories	heavy light	agriculture mining fishing harbour location	fringe zone decay suburb large area small area	railway line service line roads power line water supply residential area/workers station siding expansion land value topography	air pollution water pollution dumping sites lower land values noise/soil pollution?

⟶ goal-directed questions (what? where? why? how?)

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SETTLEMENT ACTIVITIES: RURAL

Conventional symbol	Size	Pattern	Function	Shape	Factors influencing site	Factors influencing distribution
⌁ ▪	huts village farmstead	dispersed nucleated	unifunctional primary activities	round square t-shaped linear	water arable land pasturage building materials fuel	topography aspect/slope soil?

→ goal-directed questions (what? where? why? how?)

SETTLEMENT ACTIVITIES: URBAN (MORPHOLOGY)

Conventional symbol	Factors site	Function	Elements of morphology	Models	
▭	topography drainage water trade/ transport	central place trade/ transport specialised	shape street pattern	concentric multiple-nuclei sector SA-city	

SETTLEMENT ACTIVITIES: URBAN (LAND-USE)

Conventional symbol	Land-use	Types of function	Location factors	Problems/Solutions
▭	CBD	high order low order		traffic accessibility pollution road systems
	Retail/ suburbs	isolated ribbon OBC planned shopping centre RSC	residential roads	
	Zone of decay	residential slum/ghetto light industry		dilapidated buildings urban renewal
	Residential	pattern land-use segregation ghetto's squatter	topography drainage land values roads	
	Industry	heavy light	road/rail power supply water supply topography expansion land views	air/water/noise pollution dumping sites
	Rural-Urban fringe	urban activities urban functions small holdings		arable land lost to agriculture

→ goal-directed questions (what? where? why? how?)

THE THEMATIC MAP
LEARNING A PROCEDURE: DESCRIPTION

Josefina Ostuni

A suggestive Image

Maps have always been particularly meaningful for geographers. Of course, this consideration is not casual, since the map offers a series of advantages which must be explainted not only in research but also in teaching. In this paper the map will be analyzed from the point of view of a message, and in order to do this we will refer to same definitions given about it.

> "... thematic cartography has an enormous importance because it allows a type of graphic discourse about the qualities particular of a superficial space" (Costa, J., Moles, A., 1991; 152).

> "a thematic map is normally a very generalized small scale chart which presents a very special topic, whose role is to communicate the regional structure of a geographic distribution" (Jenks, G. F., in Miller, J. C., 1979; 97).

> "The aim of thematic maps is to give, over a reference background and by means of qualitative and quantitative symbols, a conventional representation of phenomena of any sort likely to be placed, and of their correlations" (Joly, J., 1979;29).

It is evident in those definitions the reference to its function as message, to its codification as well as to what it can communicate: a graphic discourse transcribed in quantitative and qualitative symbols to represent the properties pertinent to a superficial space or phenomena possible to be placed, or the regional structure of a geographic distribution.

The map inscribed as bi-media communication is expressed, in what makes up the graphic body, in a non-verbal language that requires the support of the verbal language of the title and of the legend; only interrelated do both allow their decoding since neither language is enough by itself.

The graphic codification follows logic rules which are only fulfilled when the correspondence between measurement levels and visual variables have been respected. Even if this appears to be ambitious for students at secondary level, it is convenient to gradually introduce them to the world of symbols and their grammar.

The maps visualize over a plan different aspects of the surface of the earth. By means of them it is possible to transmit information which would, other wise, not be possible to be obtained because the reference or the subject matter of the carto-graphic message is not directly perceptible in reality. "The image - Moles points out - has made possible to bring out things, phenomena; it has made them present to the eyes and memory when in fact they are absent". (Costa, J. and Moles, A., 1991; 39).
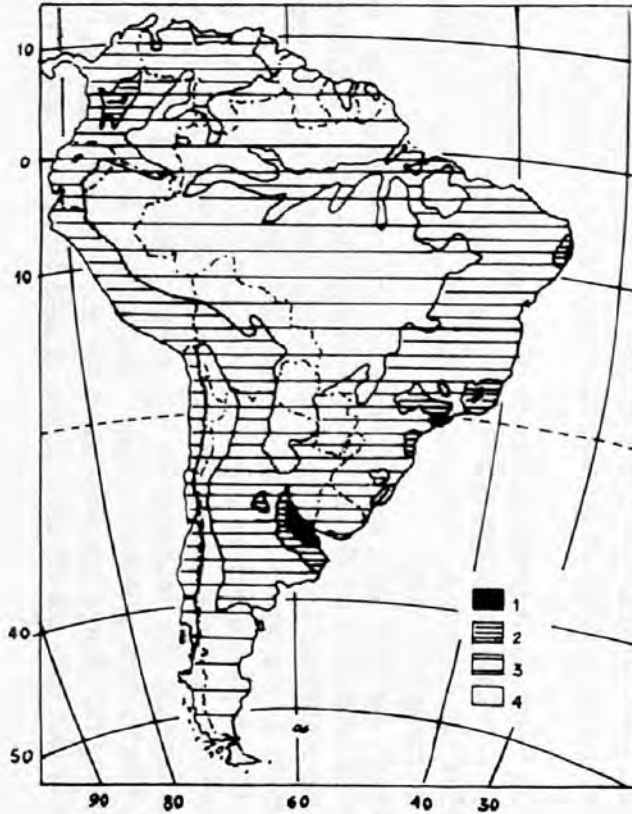
Fig. 1a - South America. Population density.
Inhabitants per Sq. Km.

1 - over 100   2 - 100/25   3 - 25/1
                         4 - under 1
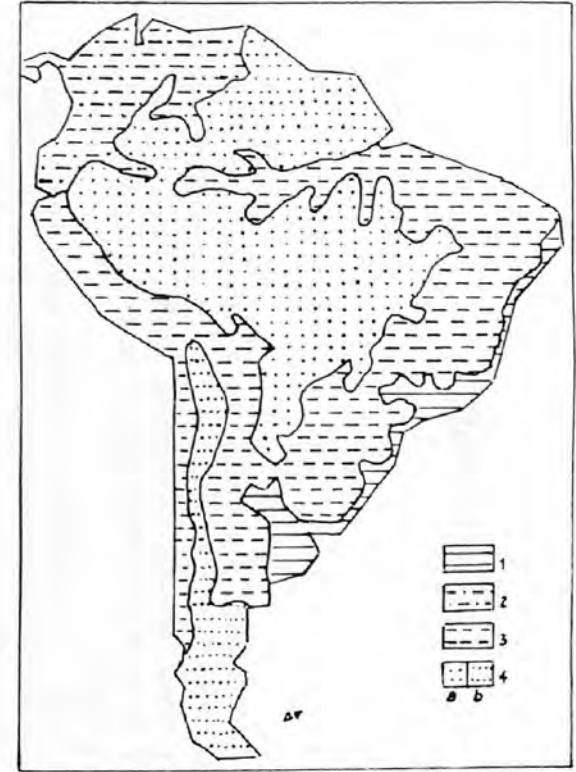
Fig. 1b - Schematized image of the population density
1. Narrow Atlantic ribbon of discontinuous high densities nuclei.
2. North western area with high densities nuclei placed in a medium-low density area.
3. Large ring of medium-low density predominance with long south running axes.
4a. Large central space of low densities.
4b. Narrow north-south low densities axis.

An example will clear up what has just been affirmed: the distribution of the population is not directly observable in reality, only does it become evident through the map.

The visual variable which represents the data with which the phenomenon has been measured assumes the dimensions "z" on the plan delimited by the axes "x" and "y". The cartographic message, codified in this way, allows surface reading since it facilitates a simultaneous and instant global perception, conditions that are not true of the verbal language because of its linear nature. In it "efficiency is found in the imposition of the pattern which is the dictatorship that it exerts over the movement of the eyes, evidence through which it lights the mind by means of seduction" (Moles, A., 1991; 30-35).

The map, better than any other means, exteriorizes the space. The direction, the relative position, the pattern, which the phenomena acquire in the cartographic representation are nothing but the properties of the spatial dimension.

To get the mastery of the cartographic message, the learner must be provided with a decoding method or procedure based on logic rules which makes its penetration easy in order to establish the ideas he holds, their hierarchy, the relationships that can be established and the structure. All these are pecularities that the cartographic message has and which it transmits more clearly than any other device.

Sylvie Rimbert (1991; 186) has properly defined what this decoding of maps can contribute:

"Beyond the concepts of base and pattern, we can imagine the surface of the earth as a field of springing up of patterns situated in their position by underlying processes barely or wrongly known. So, the essential rol of the map turns to be that of helping the discovery and perception of all those patterns with the hope of going back to the processes and even reaching the power field that activate them. In this way the map will fulfil the function of revealing morphology".

The decoding procedure, already explained in detail in other works (Ostuni, J., 1988, 1989, 1992) is based on a series of logic operations pertinent to description, which has the advantage that the recipient can punctiliously get to know the features which characterize the reference of the message.

It could be possible to establish certain coincidences with the different types of reading applied to the informative text, but the pecularities of the graphic expression suggest the use of a procedure more adequate to it.

The exploratory reading of a message, that is, its identification, places the recipient in contact with the problems, which sets in motion his intentionality, receptivity and memory.

The description is carried out by means of analytic or synthetic operations which help the learner to acknoledge the features each of them has as well as their contribution to the global comprehension of the message.

Constant reflection over these operations helps to overcome very generalized difficulties which turn up at the moment of having to compare accurately, or of having to face the elaboration of synthesis without giving way to tiring enumerations.

The decoding of a message results in new non-verbal and verbal messages: on one hand images which mould the models which exteriorize the patterning of the space by the phenomenon; and on the other, definitions of subsets which explicitely establish the relationship between the phenomenon and the space itself and the

statement of a proposition which verbally designs what the image reflects graphically. These activities carried out by the learner show the way in which he understood the message communicated by the transmitter.

By decoding the information carried by the message is obtained. This process is not limited to localization -important but not the only function-, but it also reveals the design of the structuring of the space by the phenomenon and it finds out spatial inequalities, continuities and discontinuities.

At this stage of the system it is convenient for the teacher to carry out a verification of the results so as to present the learner from carrying mistakes in the following stages of the process.

While decoding the message, the recipient-learner has an active participation and leads his learning according to his own questions and according to his own interest. Learning, thus, becomes deeper and the learner's knowledge gets ready to strengthen, modify, and even enlarge the already existent bases.

In the same way as this stage can easily be compared with that of extrapolation reading, denoting and connoting reading can not. Broadly speaking, denoting reading could be compared with the analytic operations of the description and connoting reading with its synthetic operations; however in a more careful confrontation such a comparison would appear to be very complex.

The operations of the description and the different types of behaviour that they generate as well as their formulation in a more generalizing language can be consulted on table 1.

Table 1: Map Reading. Methodological Stages

Categories Stages	Activities	Behaviours developed in the recipient	Concrete projection of the activity
GLOBAL PERCEPTION	Identify the sorrounding elements of the map: topic scale, legend.	Sets in motion intentionality, receptivity and memory.	What is this activity about? What is the space under consideration? What scale or degree of detail does it present? What visual variables does it use?
DESCRIPTION • Analytic operations	Making inventories: Find the different values of the variable in the space.	Develops the principles of localization.	xi value of the variable: Where is it placed?
	Describe linearly: highlight the characteristics of the phenomenon and the shape it acquires, in the space.	Develops the ability to identify the attributes of the phenomenon and the space.	xi value the variable: How does it appear ? and What shape does it acquire in the space?
	Compare: distinguish similarities and differences according to the characteristics	Develops the principle of comparison, mental function that provides the basis for research making classifications easy.	The A-B-C attributes of variable x: What similarities and differences do they present? What similarities

	established in the previous step. The phenomenon and the space must be compared separately.		or differences are observed in the space: the coasts with the interior, the coast among themselves and the interior areas among themselves.
• Synthetic operations	Classify: group the units of analysis in which the behaviour of the variable presents the smallest variance.	Internalizes the regionalization as a logic march. Gets the spatial structure.	The spatial units x1, x2, x3 have the character "A" and they are adjoining, consequently they make up a region or a spatial subset. The spatial units x1, x2, x3, xj have the character A, but they are not adjoining, so they do not constitute a region or spatial subset.
	Express the meaning of the message:		
	Elaborate the image. Graphically mould or produce the result of the decoding of the message.	Gets the comprehension of the message by himself.	The space and the subset are simplified in a scheme.
	Define the different subsets. Interrelate the behaviours of the variable with the properties of the spatial dimension.	Stimulates the interrelationship.	The subset "XA" whose spatial configuration has the characteristics…and the variable presents the following characteristic.
	State a proposition. Point out the relevant feature of the space in relation to the variable.	Exercises the synthesis.	The space "N" (subject) is characterized by (more relevant attributes).
EXPLANATION	Present problems from spatial configurations of the variable.	Fosters the searching for explanation.	What is the reason or the reasons why the space acquires that configuration and not another?
	Put foward hypothesis. Make synthesis of the problems in a more accurate routine in order to reach the explanation.	Helps the adequate selection of information.	Does the information obtained confirm or reject the stated hypothesis?

Table elaborated by J. Ostuni

Application of the Procedure

An example, whose content responds to programmes of secondary level, will contribute to illustrate the application of map reading in a better way. The topic chosen is "Population density of South America" and the attributes of the variable, which respond to the measuring of relation level, are the following: over 100 inhabitants/sq km; from 100 to 25 inhabitants/sq km; from 25 to 1 inhabitants/sq km; under 1 inhabitants/sq km. (fig. 1a)When reading we will proceed as follows:

Question which directs the *localization:* Where are densities... observed?	*Inventory* of spatial units
• over 100 inhabitants/sq km?	• Atlantic coast of Brazil; western bank of Río de la Plata; center of the eastern coast of Río de la Plata; north coast of Venezuela; interior centre of Colombia; western centre of Chile; interior centre of Ecuador.
• from 100 to 25 inhabitants/sq km?	• Atlantic coast of Brazil; western bank of Río de la Plata; north of Venezuela; interior centre of Colombia.
• from 25 to 1 inhabitant/sq km?	• East of Brazil; north centre parallel to the Equator in Brazil; centre, north-centre and north-east of Argentina; centre and north of Uruguay; west of Perú; centre and west of Bolivia; east of Paraguay; west and centre of Ecuador; west and centre of Colombia; west and centre of Venezuela; coast of Guayanas; north and centre of the coast of Chile.
• under 1 inhabitant/sq km?	• Centre, west and north of Brazil; south of Guayanas, south of Venezuela; east of Colombia; east of Ecuador; east and north of Perú; north and east of Bolivia; west of Paraguay; northeast, west and south of Argentina, northeast and south of Chile.

Once this stage is over, the following step corresponds to the linear description. At this stage the features of the represented phenomenon and the pecularity it acquires in the space are pointed out. With the linear description it is possible to incorporate in the geographic analysis the dimension of the space so frequently disregarded in classroom practices.

Types of densities are the elements to which reference is made in the linear description, in each of which the spatial attributes are considered.

Type	Linear Description
• over 100 inhabitants/sq km	• Small discontinuous nuclei more dense on the Atlantic coastline from NE to SW up to the 35° south latitude. In the NW angle of the continent there appear small discontinuous points both on the coast and the interior and a very small isolated point on the Pacific coast.
• from 100 to 25 inhabitants/sq km	• Discontinuous, surrounding, relatively small areas distributed on a coastline running from NE to latitude 35°; and in another north-northwest sector also discontinuous surrounding areas located near the coast and mainly in the interior.
• from 25 to 1 inhabitant/sq km	• Long, compact, continuous bow which borders the north, east and west coast. From the 18° latitude two important south-running branches emerge up to 40° south latitude, one following the Chilean coast and the other the centre-north interior of Argentina. Another branch starts in the Atlantic coast of Brazil, in a latitude approximate to the Equator forward the west near Perú.
• under 1 inhabitant/sq km	• Two areas, discontinuous from each other: a large space with an irregular oval shape with its base leant on the Equator, stretching to the south; a long diagonal starting at the north of the tropic running with the shape of a narrow ribbon on both sides of the Argentinian-Chilean border up to parallel 40° south latitude, widening, afterwards, towards the south.

The linear description, in its display of various features of the analyzed phenomenon, predisposes the mind to comparison.

If we take the behaviour of the different types of the variable, it will be easily noticed that the values over 25 inhabitants/sq km take up a small surface, appear in a discontinuous way, and generally settle themselves following the coastlines. Even

if this last characteristic is also common to the types of densities between 25 and 1, it differs here in the sense that the last characteristic occupies big continuous surfaces which are not limited to the coastline but go inland. Low densities are large continuous surfaces situated predominantly in the interior.

Even if they vary in their disposition, the same types of densities appear in the north-west corner of the Guayaquil Gulf, and on the Atlantic coast, from the north-east up to Río de la Plata.

With similar values and in continuous spaces are the Pacific coast, from the Guayaquil Gulf up to the 40° south latitude, the eastern strip of Brazil, the north-centre of Argentina, and the central strip of Bolivia.

The Brazilian central interior area and the Argentinian Chilean bordering axis to the south have the same values but they constitute discontinuous spaces.

In this way the comparison leads to the regionalization of the space. In order to do this, the units which have similar values and features and are adjoining will be grouped. In this map there is a situation which is convinient to analyze. The types over 200 inhabitants/sq km and those from 100 to 25 inhabitants/sq km on the Atlantic coast and on the north-east coast cannot be grouped because of spatial discontinuity; in this case another feature, the disposition of values, must be resorted to; through this, the subsets 1 and 2 of figure 1b are defined. In this figure the resulting regionalization has been schematizated and it is accompanied with the definition of the subsets.

The clarity of the scheme facilitates not only its memorizing but, especially, the setting forth of the causes of such a configuration.

The verbalizing of the graphic scheme (fig. 1b), by means of which this becomes comprehensible, would acquire the following pattern:

The distribution of densities of South America is characterized by the big empty spaces of the interior and southern end, which constrat with nuclei of greater densities on the coastal axes, particularly of the Atlantic.

The questions that will come out in the learner facing the elaborated image will lead, with the teacher's guide, the search for causes. His knowledge of a topic will not be limited to "where", but he will have to enquire into the processes of the settlement of the territory of South America, as well as into natural, demographic factors, etc. He will already have some ideas about some of them from previous lessons, in this case, he will only have to attempt the corresponding correlations. Other aspects will be investigated, and, in this way, the learner's knowledge is not only consolidated but constantly widened as well.

Conclusion

In this paper we have seen that when the thematic map is attributed the function of message in the teaching-learning process approached as a system of communication, it is possible to exploit all its didactic potentialities.

The need to interprete the message alters the traditional layout of giving priority to to teaching to the detriment of learning. From the point of view of this proposal, the learner assumes an active role as he is motivated to find the answers to problems that he himself has detected. And it was this point of giving information about questions which had not been previously made by the learners where the criticism to traditional didactics was aimed.

The results of the decoding the thematic map gives birth to new messages, which ensures the dynamic of the system, favouring a constant interaction between the agents of communication.

The elaboration of messages by the learner develops in him instances of behaviour which ensure his integrate up bringing. The image resulting from map reading has demanded an abstraction which overlooks what is accidental in order to highlight what is essential. The representation in graphic schemes facilitates the memorizing and, above all, the inteligibility and comprehension of the original representation. This ensures a critic attitude when selecting and hierarchizing ideas, and reflection when reaching levels of abstraction. Writing the definition of subsets and of the proposition makes possible the formation of concepts about the subject matter of the map which will win in degrees of abstraction as far as student's recepting thus allows it.

The searching for information, selection and later organization gradually consolidates, by regular exercise, a critical and creative attitude goals at which the contemporary pedagogy is aiming all its efforts.

An efficient codification, preventing any kind of ambiguity, and neat decoding process, ensuring correct comprehension, are the previous demands which have to be considered so that the thematic map could contribute to the teaching-learning process all its possibilities as a didactic resource.

Finally, with the cartographic expression, the student is drilled in the graphic language, which introduces him in the cultural context of the image, training him to critically interprete all the signals which he is frequently confronted. From this it follows that the reflection and critical use of the thematic map makes of it a creative educational device not to be disregarded.

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THE LINGUISTIC-SYMBOLIC STUDY
AND GEOGRAPHICAL COGNITION

Shi Xuan

Abstract

This paper will combine the geographical education with the perspective on the realm of language, character, symbol. Through discriminating the differences of the same content in geography studying expressed in English and in Chinese, it can be realized that language, character and symbol take an essential role in the geographical cognition. Geographical education in the pre-college stage is deeply influenced by students' ability of linguistic, literal and symbolic comprehension which should be developed organically to break through the difficulties in the subject learning. It is therefore suggested that those geographical terms, literal expressions and graphic attributes could be regarded as special symbols and educators should pay much attention to the affections of such geographical and non-geographical features presented in those symbols on the teaching process and on students' cognitive behavior.

Introduction

Language, character and symbol stand here in this paper side by side but in human history, language originated and developed first, then character appeared and evolved after the invention of writing, and now the symbol activity is regarded as the speciality of the human kind while obviously, character is the senior form in the symbol world. Such gradational relationship is distinct. This paper will discuss the impact of such symbol activity on the geographical cognition and try to show another similiar relationship in illustration and analysis from the phenomenon to the essense and then the practice in geographical education.

Hypothesis and contemplation – a multicultural phenomenon in geographical education: if the geographical knowledge the students learnt is equivalent both in the United States and in China, then besides geographical knowledge itself, what else could students obtain from geography lessons? When we compare the content of 1993 U.S. National Geography Bee questions in English with its Chinese counterpart, we could find that U.S. students develop their vocabulary ability in the geographical education while literal comprehension is essential to Chinese students. But it seems that educators in China might neglect the literacy respect in geographical education. Due to the Chinese character and its cultural background, such delinquency would be a potential factor for the students' difficulty in geographical cognition.

Language's role in geographical education: geographical information carrier. It is proved by psychological research that the more abstract the cognitive materials are, the more difficult people draw the right conclusions. Both the geographical information and the linguistic symbols are abstract objects to students. When they

study geography, the cognitive and thinking process should be completed majorly with the aid of language and character tools on which geographical information is imposed. So, when students recognize the natural and human environment through the medium of the teaching materials, their ability on literal understanding would be a dicisive factor to their cognitive depth and such ability will progress with their intellectual development.

The system of geographical symbols and the geo-information interpretation. Until now it is difficult to investigate how language and characters engendered in the human history. But we could differentiate and analyse the attributes of geographical symbols through studying the history of geography and the development of geographical thought. Since the geographical symbol is not an independent system, we could find that the geo-information is imposed on the linguistic and literal symbols, and thus, the same symbols and their combination express the different means, i.e. the geographical idea and non-geographical idea. Such phenomenon could be found especially in the Chinese world. As those 2,500 most commonly used Chinese characters had been taught in the elementary schools, when students study geography in secondary schools, those geographical concepts will appear in the identical forms. Although the knowledge is fresh to the students, the symbol as information carrier is secondhand and surely do not have any stimulative function at the initial stage of the perception. Therefore geo-information interpretation is an indispensible procedure in geography teaching to highlight the geographical ideas in the linguistic and literal symbols.

The integrated and effective concept of the space. To understand the concept of space with the aid of geo-symbols is one of the essential tasks in geography teaching and a difficulty in the students' cognitive process. In junior high schools, mathematics only deals with the elementary algebra and then the plane geometry but the location method in an arbitrary grid system, the mathematical coordinate, is based on the solid geometry. On the one hand, the problem how to locate places is raised first in the geography lessons other than the mathematics lesson; on the other hand, a contradictory is obvious that the knowledge of location system is highly abstract but the knowledge in students' possession is limited as well as the practical experience is insufficient. Moreover, the concept of space, the location, could be expressed in various ways, such as the relevant terms in the thematic studies of geography, e.g. the Mediterranean Climate Zone also refers to some particular regions on the earth space. The criterion for an integrated and effective concept of space should consist of three parts: the symbolic definition system (literal, mathematical and graphic characters); the designated location on the earth space; the concrete places in global distribution. Under such circumstances, to gain the power of spatial conception would be a long-term process by certain stages in geographical education.

The classification and analysis on School Maps. The map is a particular creation of the human in the world of symbol which brings out the information of the geo-space. As spatial information carrier, the map is an important measure in comprehending and studying the geographical environment. In view of the geograpy teaching and students' cognition, with the aid of the classification research and analysis on school maps, the textbook compilation could be more rational to show the internal relations of the knowledge in literal expression. In classroom instruction, map interpretation and analysis should be an indispensible assistant to understand the multi-dimensional geo-space and the environmental traits. The locational system and global-distribution of landmasses and oceans are the foundation of the school map network.

Building the geographical knowledge structure on the basis of analysing human experience in geographical cognitive process. Generally, the teaching materials pay much attention on the systematic and complete structure of the geographical knowledge, but the cognitive order of geographical discoveries might be in a less important position while students could hardly have the awareness of comprehending the coherence and relations among those independent chapters. Several severe delinquencies would appear in the geography teaching and learning owing to such arrangement. In this paper, some suggestions for improving such defects will be discussed. As it is illustrated in the sketch map, the knowledge system comprises three sequential series: the cognitive activities-from near to far-on the static space of the earth surface system; the perception on the dynamic characteristics of the earth taking the sun as the reference frame ; regions of the world--the regional system.

A Simple Dilemma

Discussion starts from these questions:
1. The science that deals with the study of earthquakes takes its name from the shock waves that earthquake generate. The science is known by what name ? (Answer: Seismology)
2. The kayak was first used for hunting and fishing by ancestors of people who live in lands bordering which of the earth's four oceans? (Answer: The Arctic ocean)
3. Calm regions known as horse latitudes are centered on two named lines of latitude. What is the name of one of these lines of latitude? (Answer: Tropic of Capricon/Cancer)

These above three questions are selected from U.S. 1993 National Geography Bee questions.

Obviously it is not an easy thing to U.S. students to be a prize-winner in NGB Competition as such fact seems to be affirmed by that NGB Champion will win a scholarship upto US$ 25, 000 and they do deserve such honor and prize.

But when these questions are translated into Chinese, things might be easy much more. Here is the explanation on the key words in these questions in Chinese expression.

* 1. Key words--earthquake : 地震 ; shock wave : 地震波 ; seismology : 地震学. In literal translation: " 地 " means "the earth, land, soil, ground " etc. " 震 " means " shock, quake, vibrate" etc. " 波 " means "wave". " 学 " means " subject of study, discipline, course" as a noun and "study, learn" as a verb. Therefore--the answer could be infered from the literal expression in Chinese: " 地震学 " just means "the science about the earthquake" without any relation with the shock waves. It's a easy problem to everyone who learnt the secondary school geography, but, on the other hand, " seismology ", the answer as an English word, is strange to all high school students and most of the college students.
* 2. Key words- Kayak : 爱斯基摩划子. In literal translation, " 爱斯基摩 " is a transliteration, means " Eskimo "; " 划子 " means "small rowboat". Since the name of "small rowboat" is different around the world, when translating the " kayak " into Chinese, particular explanation should be given to this word to let people know what kind of rowboat it is (e.g. " Gondola " in Vennice). If " kayak " is transliterated into Chinese, it will only be a pronouncing symbol without any essentiality. Therefore this question is also easy to any literate people as it is well known that Eskimos live in the Arctic Region, that is to say, " 爱斯基摩 " (Eskimo) infers the answer--the Arctic ocean.

* 3. Key words--horse latitudes : 回归线无风带; Tropic of Capricon : 南回归线;   Tropic of Cancer; 北回归线. In literal translation, " 回归 " means " come back again ";" 线 " means " line "; then " 回归线 " means " Tropic "; " 带 " means " area, zone; belt ".   So the definition " horse latitudes " in Chinese literal expression directly infers the " tropic " region. Thus the answer is clear to students: there are two " tropic " lines in the world. " 南 " means " south "; " 北 " means " north ", then, " 南回归线 " means " the tropic on the south-hemisphere "; " 北回归线 " means " the tropic on the north-hemisphere ".

On the contrary, all these English key words take the critical role when U.S. students answer these questions – if they do not understand the meaning of these words, they could hardly give the correct answer.

According to the above-mentioned comparison, a hypothesis could be proposed: the geographical knowledge the students learnt could be regarded as the same both in the United States and in China, and then, the comparison reveals an interesting phenomenon that U. S. students should master a large number of words and phrases to understand the same content of courses while in China, the brief expression in Chinese character contains the abundant information which is equivalent to its English counterpart. For this reason, it is clear that it is just the literal expression by different language that cause the dilemma in determination whether the NGB questions are easy or difficult. Further discussion could be evolved from the insinuation by such dilemma that Geographical cognition might be deeply influenced by the different cultural characteristics and background.

Why Literacy in Geographical Cognition

It could be concluded that U.S. students developed their literacy respect especially the vocabulary ability in geographical learning if they make a thorough and active investigation and study on geography subject. As English information should be expressed by a large vocabulary, it might be a necessity to U.S. students to get adequate words and phrases in their successful learning and living. Certainly, vocabulary itself is not the language, only when those words and phrases are properly used in the concrete language circumstances, they could express the comprehensive idea. For this reason, to develop the ability in literacy and oracy might be a conscious action in geographical education in the English world. Such assumed fact could be evidenced also by the NGB instruction as it states that students will not be penalized for inaccurate spelling and pronunciation and thus students are encouraged to try their best to give the answer while their literacy and oracy ability could be improved.

In China and Chinese cultural background, it should be wondered whether the ability in literacy and oracy is developed in geographical education and whether it is a conscious action of the teachers and students to develop such ability in geography lessons. If you make an investigation in classroom teaching and learning, you might be regretful to find that the students do not have such awareness that geography lessons also give them an opportunity to enhance their ability in literal and oral expression, and, at the same time, seldom have you seen any exposition on such respect in those academic journals or teaching materials.

It seems that such indifferent treatment does not catch the attention of the teachers and students. In fact Chinese characters developed from pictography to modern form which express various meaning but the number of them is limited in contrast with the English vocabulary. As those 2,500 Chinese characters most in use have been taught in elementary school education, students will only learn a few new words

during their three to six year secondary school period. According to such fact, it can be realized that the vast amount of geographical information is illustrated by those limited characters in the textbooks. Obviously students' cogition on geographical environment through classroom teaching would be greatly influenced by their ability of literal comprehension. Therefore, special consideration should be given to discuss language and character's role in geographical cognition.

But on the other hand, the major tasks in the Chinese lessons focus on
(1) strengthening students' vocabulary ability in hand; (2) developing students' ability on literal comprehension, structural analysis and compositional application; (3) building up student essential ability of verbal expression and logical thinking, etc. Under such circumstance, it might be asked why literacy awareness should become a consciousness in geographical education as such suggestion seems digress from the main topic of geography subject: it is the geography lesson, not the linguistics lesson? Here is the explanation:

(1) Regarding the characteristics and the level in students' (esp. those junior grades students) intelligence development, when students go to high schools, their thinking behavior is developing in a transitional period from thinking in terms of the concrete images to the abstract and logical thinking. On the one hand, as the character is an abstract symbol, students could hardly be qualified to understand thoroughly what the language and the character mean at this transitional stage; on the other hand, the content of geography teaching gives students the abstract description on geographical phenomenoa and objective reality as well as the rational analysis and comment at the higher level while spatial imagination is indispensable to understand such complicated illustration. Therefore the process that students acquire the geographical knowledge could be regarded as a compounding procedure of the pluralistic information.

It is clear that language and character become the information carrier on which geographical knowledge is loaded. This result in a big burden to students that they have to accept two kinds of abstract object: the geographical knowledge which is fresh to them and the linguistic, literal and graphical symbols which are not easy to grasp the essence of the content simultaneously. Learning would be beset with difficulties. For example, Fig.1 might be typical of this problem. It appears to junior grade one students (12-13 years old) at the beginning of the studying. At this stage, students do not have any knowledge about the plane geometry, let alone giving literal explanation to multi-dimensional picture in varied visual angle. Even though after giving detailed illustration several times on such interesting phenomenon showed by the picture, it is still a difficulty to students to understand what the picture means. They try to imitate and rearrange the teacher's interpretation, but their literal and oral expression manifest that they only have a hazy understanding to the picture. (Fig.1)

(2) Although educational geographers understand that geography teaching should not only depend upon the textbooks and maps, practical experience in excursion, fieldwork, observation and surveying is also needed, nobody could gainsay that in modern school education, students acquire the geographical knowledge, perceptual or rational, principally from the literal and graphical illustration in the teaching materials other than the practice. Those practical opportunities only promote students' interest to geography subject but could hardly take the place of the role of classroom teaching. So students cognition and thinking to the real world as well as the formation of spatial conception would be accomplished on the basis of literal and graphic comprehension. The cognitive depth would be decided by their faculty of

literal and graphic comprehension and will be deepened with their intelligence progress.
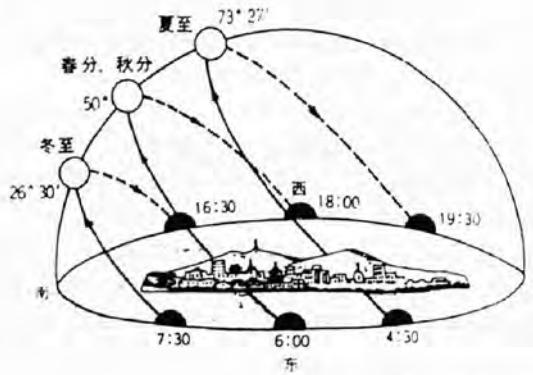
(Fig. 1)

(3) Language and character take the key role as information carrier in the cognitive activity.

Fig. 2 shows that teaching and learning process is obviously a procedure of information editing, interpreting and restoring. All these three steps could not complete without the information carrier. At the initial stage of their transitional period, during such superior thinking activity, students do not satisfy the essential requirement for information compilation, their fundamental ability in linguistic and literal expression enable them to have basic skills in information interpretation, but still it is difficult to get the perception of the real world through information emulation to restore the symbols to the substantials. Even though the perceptual information materials could contribute to these three steps, i.e. the teaching activity and geographical cognition, the whole procedure have to be completed finally with the aid of symbol activity.
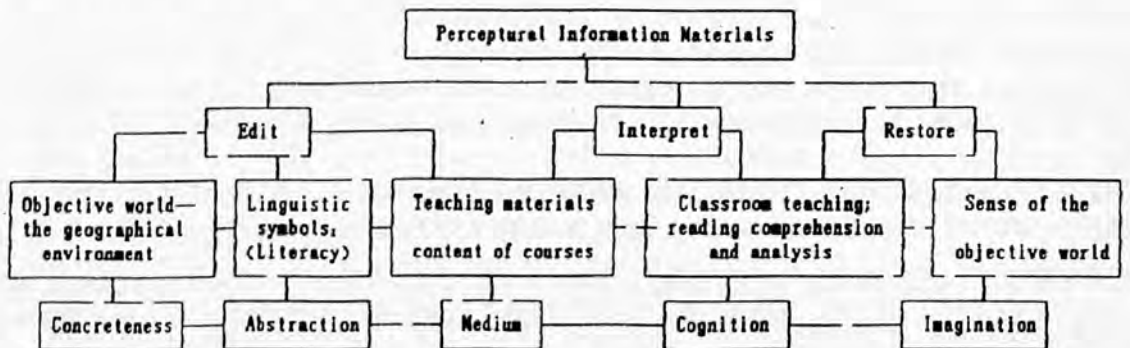
Fig. 2   Information Transformation in Gegoraphy Teaching

(4) Through observation and practice, students (a) acquire the geographical knowledge in classroom teaching and learning, (b) change the acquired information into their own ideas, (c) deposit the information in their memory, (d) elaborate those geographical concepts and problems they've learnt, (e) apply the essential theoretical

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knowledge to discuss the real issues – it is unimaginable that every step in such thought process can be realized without the literal and graphic tools. Only after they have really digest what those literal and graphic symbols mean, then they could accomplish the whole cognitive process. Furthermore, students will have the qualification for information compilation and interpretation, and surely they could express (literally and orally) their ideas freely.

Geographical education should pursue and realize such goal which could be regarded as the criterion to assess whether the students understand the content of geography course. In teaching practice, geographical knowledge is devided into three cognitive levels by the Syllabus: knowing, understanding and applying while psychological research indicates that understanding is the most important factor for a better and effective knowing, and, the aptitude in applying will be decided upon the degree of understanding. Therefore understanding is the key to learning and cognitive activities and it starts with literal comprehension.

In classroom teaching, a common malpractice could be found that students often repeat what the textbook says without thinking when they answer the classroom quiz. In fact, repeating only present a false picture to teachers as if the students have understood and mastered the content of teaching but perhaps students might not understand what those literal expression means or even such repeating is not freely. Repeating means nothing but only reading ability!

On the other hand, such malpractice implies that literacy in geographical cognition is different from that in linguistics class as those verbal symbols express the geographical information and ideas other than general meaning. Educators should make special efforts to separate and interpret the geographical ideas loaded on the information carriers.

The System of Geographical Symbols and Geo-information Interpretation

In modern behavioral research, symbol activity is regarded as one of the fundamental types of human intelligence and as the distinction between the human kind and other beings. Language/character is a highly-developed form in symbol system and is the medium for information and idea exchange.

Reading the quotation at the beginning of this paper again (... geographical education contributes to literacy, oracy, numeracy and graphicacy), it could be affirmed that the contribution of geography to education is just to promote students' capability in symbol activity: use various symbols to express special ideas in geography category accurately.

In the United States,one of the skills developed in high school geogrpahy is Asking Geographic Questions – giving students practice in distinguishing geographic from nongeographic questions. In China, some scholars indicate that the cardinal goal for school geography is ... to develop the geographical thinking. All these statements mean that the abstract information which illustrates the features of geographical environment is loaded or imposed on those linguistic, literal and graphic symbols. New implication is bestowed on these symbols and then, discrepancy could be found between these special symbols expressing geographical information and those linguistic/literal symbols in common use for human communication. Moreover it could be realized that such "geographical symbols" exists in the "nongeographic" symbol systems.

Geography builds a bridge between natural and social science. Along this historical long bridge, the nature of geographical symbols could be traced as it is showed in Fig. 3. The literature tradition is obvious in the history of geography. This could be testified by a lot of works about travel notes, local chronicles and topography, observation records. But the scientific ideas in geography had laid the foundation early in ancient Greek Times.
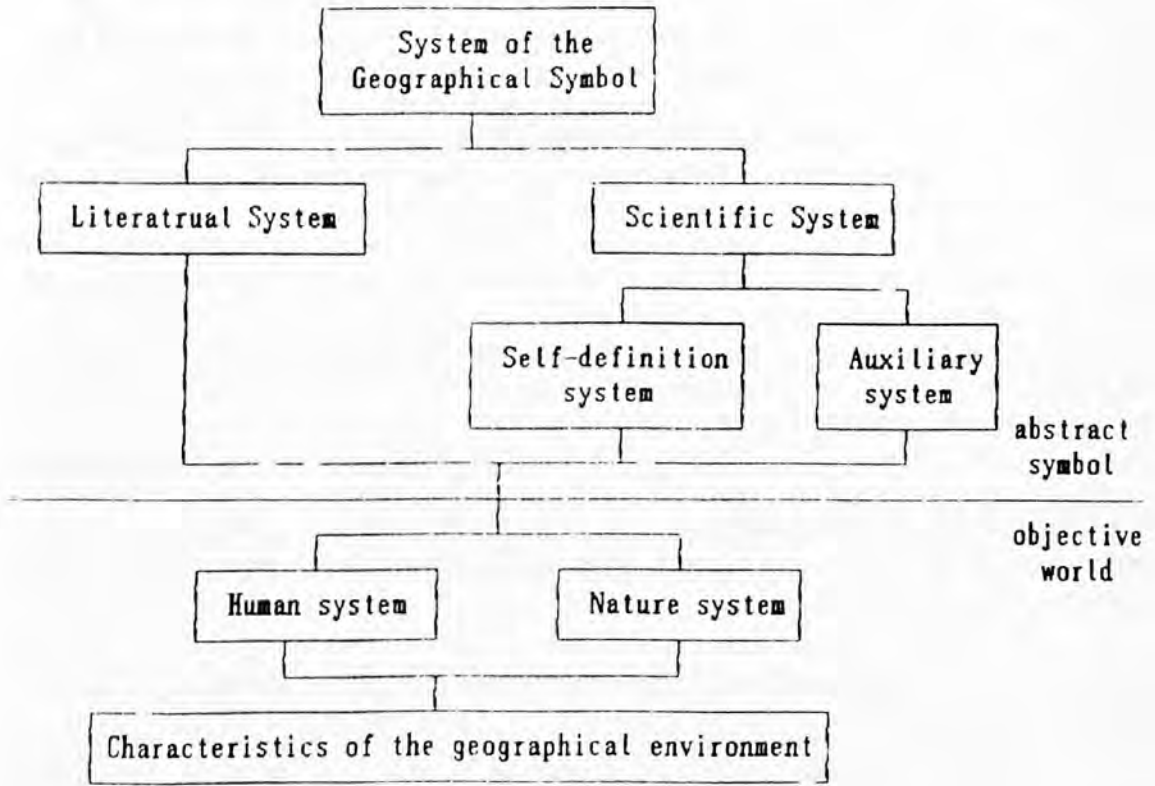
Fig. 3   System of the Geo-symbols

The system of geographical symbols enriched gradually with the progress of human society, the development of science and technology, and the evolution of human's cognition to the environment. Therefore geographical symbols as the record of geography and geographical thought also reflect the development of the science of geography. The scientific branch in the symbol system consists of two parts: (1) the self- definition subsystem as the core majority contains those concepts, technical terms, reasoning formula, graphic symbols (map), etc, but anyway, landscape and phenomenon discription should be expressed by literal tools; (2) the auxiliary subsystem refers to the symbols in other relevant subjects which are indispensable to the rational analysis in geography and to the geographical thought.

To enable students to distinguish the geographical information/idea from the nongeographic idea and develop geographic thought in geographical education, educational geographers have to make detailed study on how to separate and interpret the geographic information loaded on those symbols, especially in literal expression, and then, guide the students' cognitive activity:

(1) How geographical information is loaded on those words and phrases.
Chinese character evolves from pictographs. In many cases, information interpretation should be initiated from the discussion on the relation among the geographical significance, the character symbols and the graphs.

(Fig.4)

* Example 1. " 经 " and " 纬 ".
In ancient Chinese civilization, the original meaning of 经 is warp and 纬 is woof, that is, the vertical lines and horizental lines of the cloth; also 经纬 refers the road/path: in north-south direction is 经, in east-west direction is 纬. Further, the geographical significance appears : (See Fig.4)
经线--meridian ; 纬线--parallel (线: line)
经度--longitude; 纬度--latitude (度: degree)
经纬网--fictitious graticule (网: net,network)

* Example 2. " 锋 "
The original meaning of 锋 is the pointed end of a weapon, then its sense is extended to the vanguard of the troops. Further this character refers the " front " as the geography concept as it is showed in Fig.5, that is, the meeting place for the " vanguards " of two air masses with different nature.

(Fig.5)

* Example 3. " 脊 ", " 槽 ", " 鞍 "
Fig.6 is an isoline map in geography category (hypsometric map or a col pressure field map). Chinese characters used in discribing and defining the certain part in the map especially have the close relation between the graphic inforamtion transfer and their original meaning.
脊 means backbone/spine originally and then refers those upheaval shapes;
槽 means trough and groove;
鞍 means saddle.
When this isoline map is transformed or imagined into the stereoscopic model, those concepts and definitions would be explained easily by ist surface undulation.
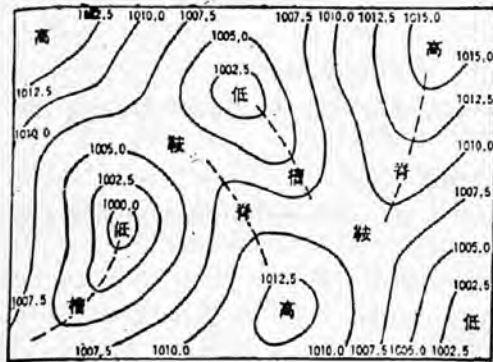
(Fig.6)

(2) Special terms implication.
Geographical information and ideas are loaded on varied symbols. But in the cognitive process, as these symbols presented to students in the familiar forms, students seldom go deep into details to discriminate those geographical ideas from the common literal interpretation, let alone the potential implication from the context. Hence, if the teachers do not call their attention to analyse the different meaning (geographic and nongeographic) expressed by the same words and phrases at the initial stage in cognition, a false picture – a reciprocal mistake would appear in the teaching practice: the teacher might feel that students have understood the geographical meaning of those symbols because students are able to repeat what textbook says but actually, it is only a repeat other than comprehension; on the hand, if teacher do not make further inquiries, students will feel complacent as if they really understand what the textbook says.

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Example 1. Key words: Transit; Transit center; Transit trade

Regarding the economic development in Singapore, the textbook indicates: "As geographical location is advantageous, Singapore is always the distributing and transit center for trade and commerce activity among Southeast Asia countries. In recent twenty years, on the basis of transit trade...", etc. As separate character, these key words are very familiar to students, but as fresh concept, they could hardly give the proper explanation on these words. Especially, to answer such questions listed in their homework: How does the geographical position influence the economic development in Singapore? What experiences can we use for reference from the economic development in Singapore? The relation between the locational features and the transit trade is the key to answer the problems. Usually students do not have such comprehensive thinking ability. They only know these words and phrases other than the implication of the geographical knowledge from the context.

Example 2. What geographical information the concept Perihelion and Aphelion indicate?

These two concepts are easy to understand as it is illustrated by Fig.7 when they are used merely in describing the earth's situation in the revolution orbit. But many geographical information and phenomena could be evolved from these two concepts and as prerequisites in certain questions while such conditions could be transformed reciprocally. Potential implication could be drawn from these two concepts that Perihelion and Aphelion have the inter-relation with:

- the earth revolution speed;
- the calendar and the season;
- the sun's altitude at high noon and its changing tendency;
- the position and the moving tendency of the point at which the direct rays of the sun shoot the earth;
- the length of day and night and its changing tendency;
- all those natural and human phenomena which have obvious variation annually and seasonally.
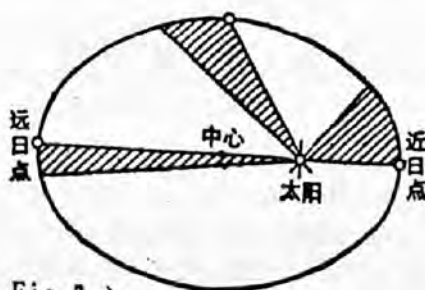
(Fig. 7)

(Regard paid to both the North and the South Hemisphere). For this reason, Perihelion and Aphelion should not be regarded as pure concepts.

(3) Geo-inforamtion interpretation on general declarative sentence.

Declarative sentence is usually used to express general rules, principles, deductive conclusions in geography category. As some words and phrases in the illustrative statement seem to be "geographic", students would usually be satisfied with a smattering of the superficial knowledge: they may recite/repeat/transcribe the textual quotation, but in fact, it is only an illusion other than the reality!

Example 1. "The world cultivated lands which covers large areas usually distributed over those moist plain regions in the temperate zones".

To get a more comprehensive understanding detailed geography inquiry should include:

.. Why not the arid plain region/moist mountain region in the temperate zones?

.. Why not the moist plain region in the tropical region?

Geographical idea insinuated by these statement seems to be:

(a) temperate zone refers to the temperature factor. The accumulated temperature in frigid zone is less than the essential requirement for plant growth. But why not tropical- moist plain region, such as the Amazonian Region? The reason is that Tropical Rainforest Climate is not suitable to human survival while the cultivated land is only the human's masterpiece.

Such cultivated lands could be found in the Tropical Monsoon Climate zones;

(b) moisture condition obviously refers to the water-supply in special regions and includes both natural precipitation and irrigation condition;

(c) plain region refers to topographical features. It is more arable in plain regions other than in mountain regions in where cultivation may cause soil erosion.

Example 2. "Densely populated areas usually can be found along coastal regions in the middle latitude zone of the Northern Hemisphere".

If students go deep into interpretation and investigation, further geographical idea could be revealed as listed below:

.. Why not the homological regions of the Southern Hemisphere?

.. Why not the low latitude or high latitude regions?

.. Why not the inland areas?

In this category:

(a) the Northern Hemisphere indicates global distribution of land masses and waterbodies, i.e. middle latitude zone of the Southern Hemisphere is covered majorly by waterbodies other than the land masses;

(b) middle latitude zone indicates the proper temperature factor and shows the relation between location and the thermal condition, i.e. temperature in low latitude regions is too high and in high latitude regions is too low for human survival;

(c) coastal regions indicates – alluvial plain as the majority of topographical features and, the sufficient precipitation.

If students could separate all these geographcial factors from the text, they would really grasp the essentiality of geographical cognition.

Example 3. "The bigger the map scale is, the more detailed the map content shows but the smaller the area covers in map illustration". (See Fig. 8)

Literal symbols is insufficient for students to understand this general regulation thoroughly, so, educator should give detailed interpretation on mapping process to let students know that

- how geographical information is input into the map;
- how and why the map content changes with the variation of the map scale while the area displayed in the map changes simultaneously;
- pay attention to the prerequisite of the problem that the map size keeps unchanged;
- that evolution procedure could be initiated from school level to home surroundings, local area, home city and province, the country and the world.

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│  │ Detailed │────────────────│ Map Content │────────────────────────│ Simple │   │
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│  │ Small  │────────────────│ Area range showed │───────────────────│ Large │     │
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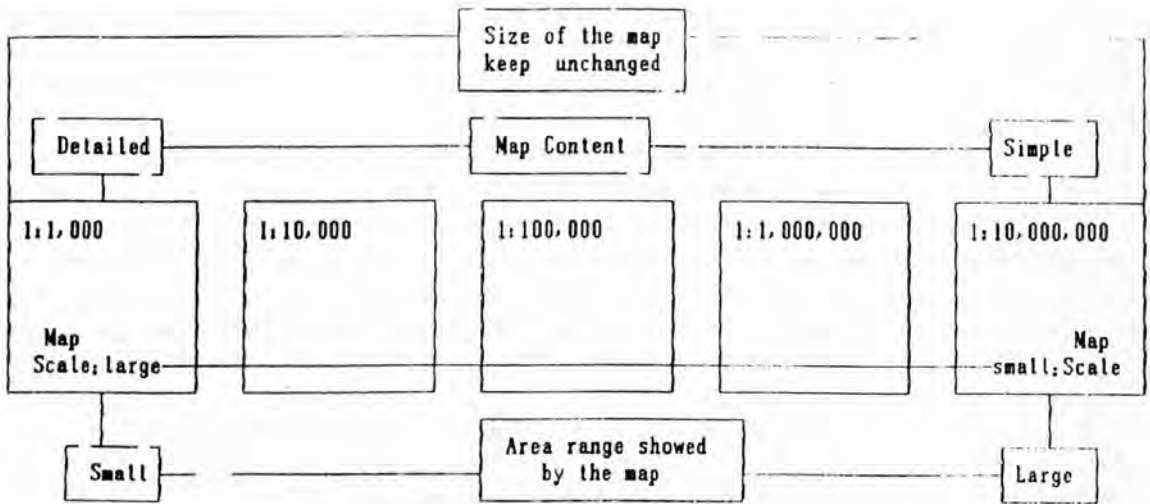
Fig. 8   Illustration on the Map Variation

Only in this way, students could get a preliminary knowledge about the map elements. Otherwise, students would be incapable of practical map interpretation even though they could repeat this principle freely.

In brief, detailed interpretation on the dissimiliar meaning – geographic or nongeographic – of the identical symbol takes an important role in geographical cognition. Teachers should not over-estimate students' ability and consciousness on information interpretation beyond the content of courses. If students are able to repeat/transcribe the textbook, it might be only a misconception other than the reality!?

The Integrate and Effective Concept of Space

The "Charter" indicates that "Geography is concerned with human-environment interaction in the context of special places and locations", and, "Persuing the answers to these question necessitates investigating the location, situation, interaction, spatial distribution and differentiation of phenomena on the earth". In view of those above-mentioned examples, it could be concluded that geographical symbols is characterized by a distinctive spatial concept.

To build up the concept of geographical space by the geographical symbols is one of the substantial contents in geography teaching and a difficulty in students' cognition/learning. In teaching practice, to help student to break through such disturbance of thought, attention should be paid to the following major respects.

(1) Mathematical basis and practical experience. The exact location of special places could be identified by the mathematical coordinate system of longitude and latitude. Such abstract fictitious system is on the basis of the solid geometry but when students recognize this locational system, what they learnt is just the number axis in elementary algebra which only display the space of one dimension (junior grade one), then the plane geometry (junior grade two) and furhter the solid geometry (senior grades).

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Although space as literal concept is not strange to students, the locational system and the concept of location is completely a new idea to students. Usually in daily life, the common visual sensibility is only the plane of two dimensions and the three-dimensional objects. Students could take various balls as the reference frame to imagine the earth as a globe, but they never have the mind of how to locate special point on a spherical surface. Moreover, they would be puzzled over that how spherical space is transformed and showed by the planimetric maps.

(2) Even though after giving so much interpretation and illustration on the locational system with the aid of the terrestrial globe, students would get a tentative knowledge about the system of longitude and latitude, but it is not satisfied to say students have got the aptitudes for the spatial concept!

The locational system of longitude and latitude is only a mathematical method. So this is the first step in students' cognitive process. Then geographical information could be introduced into such mathematical system: the continents and oceans, significance of specific meridians and parallels (longitude and latitude), technical terms in thematic studies, and so on.

Hence the concept of geographical space could be developed following these steps:
a. understanding the symbolic definition system illustrated by literal, mathematical and graphical symbols;
b. finding the position on the spherical surface corresponding where the symbols refer to;
c. integrating the concrete places with the symbols and locations;
d. promoting comprehension in all above respects from specific point/place to line/region then the area/zone.

For example: regarding the "Tropic of Capricon" (literal symbols), students should first know its latitude (literal and mathematical symbols), then understand where the line extends on the spherical surface of the earth (learn the graphical meaning and have the imaginative power about the real world), further, realize the major continents and oceans the Tropic of Capricon cut across. (Same to the Tropic of Cancer)

For this reason, it seems that students would have to take a long time to get the consciousness and aptitude for the complete concept of geographical space.

(3) Geographical information is so abundant that many technical terms implicate the location idea, that is to say, space concept is an indispensable prerequisite for students' cognitive activities in geography field. On the other hand, these technical terms are scattered in separate chapters in which professional knowledge on specific realm would be presented independently. Although the text arrangement in this way would help students to master the geographical knowledge systematically, they could hardly become aware of the extensive relation between the literal terminology and the spatial view from those isolated systems.

Regarding the absolute location identified by longitude and latitude, if students really understand the fundamental principle of this locational method, one by one they could correspond the mathematical definition to the specific place on the map/graph and furhter the real position on earth surface by imagination. Such cognitive process could be regarded as a close system.

Relative location would rather be an open system as many definitional factors would make the location concept more geographic. Such cognitive process assumes a more complicated feature that one concept (location) corresponds to multiple

interpretation (literal, mathematical, graphical symbols, direction, distribution and phenomenon, technical terms, etc.).

For example, the Mediterranean Climate Zone, refers to the regions on the west coast of the world continents between thirty to forty degrees (North/South) latitude. Thus the relevant requisites would include:
- technical terms: the Mediterranean Climate Zone (MCZ);
- absolute location: thirty to forty degrees latitude;
- direction: west part of the continent;
- distribution of land masses and waterbodies: illustrated by the "coast" region;
- concrete places: areas corresponding to this definition cover the MCZ regions in the South Europe, North and South Africa, North and South America, South Australia, coast edge at west Asia, etc..

In teaching practice, every topic of such knowledge belongs to the separate chapter. In this case, when facing the real instance for a space concept, if students could not have the consciousness about both the abstract description and the objective world, their cognition on the concept of space, the location, is not integrate and effective.

(4) Because of the complexity of geogrpahy and also because that class hour allocated to geography subject is limited, the concept of space could hardly be built up in such a short learning period. It could be discovered that when students begin to learn the new concept, formula, theorem, law, etc. in mathematics, physics and chemistry, they could not grasp and understand these fundamental principles and then apply them to the concrete problems, unless, they do a lot of exercises following the examples; and that when studnets begin to learn new words and phrases, general grammatical regulations, practical composition, etc., they would satisfied the essential requirement of listerning, speaking, reading and writing only through a lot of practical exercises inside and outside class (transcription, recital, memory writing, drills, etc.). But, unfortunately, both the concept of space and its symbolic expression belong to the self-definition subsystem in the system of geographical symbol and all of them are fresh but abstract knowledge to students; on the other hand, further investigation and study in geography class is on the hypothesis that students have built up the spatial concept. When students do not know how to reply the real problems, they have to repeat what the textbook says.

It is therefore suggested that teachers and textbook editors should pay attention to the following aspects:
- Manage to increase the time allocation on the locational system of longitude and latitude, special drills should be designed just like those in other scientific subjects to enable students master the fundamental ideas about the absolute location;
- When in systematic and thematic studies, interpretation should continually focus on saptial information and features whenever possible to enhance students' capabillity on the space perception;
- Both the geographical environment and the science of geography are open systems with the dissipative structure. Hence students will be at a disadvantage when their cognitive activities are in the isolated and close situation. To build up the integrate and effective geo-space concept, educational geographers should consider on how to promote the transference of geo-information among different chapters/fields to help students to realize the internal relation of the knowledge structure and of the individual elements in the geographical environment.

Classification and Analysis on School Maps

Illustrative graphs are applied in many sciences and arts courses to help students to understand the subject idea. Evidences could be found that without some of those diagrams, the same result could be realized especially in linguistic, literature, history and politics. Pictures even could be cancelled when profound criticism and skills are illustrated to upper grade students. But, on the contrary, map is indispensable in geography teaching and learning, especially further investigation in advanced courses would depend upon map interpretation and cartographic analysis to a great extent.

Scientific studies in geography and geographical education have distinct demand on the maps. Classification and analysis on the school maps would focus on the impact of graphic symbols on the cognition to the geographical environment. As almost all of the geographcial information is implanted in the geographic base map which essentially comprises the locational system of longitude and latitude and the distribution of land masses and water bodies at global/regional levels, major tasks is obvious in demonstrating the school map network as it is showed by Fig.9.
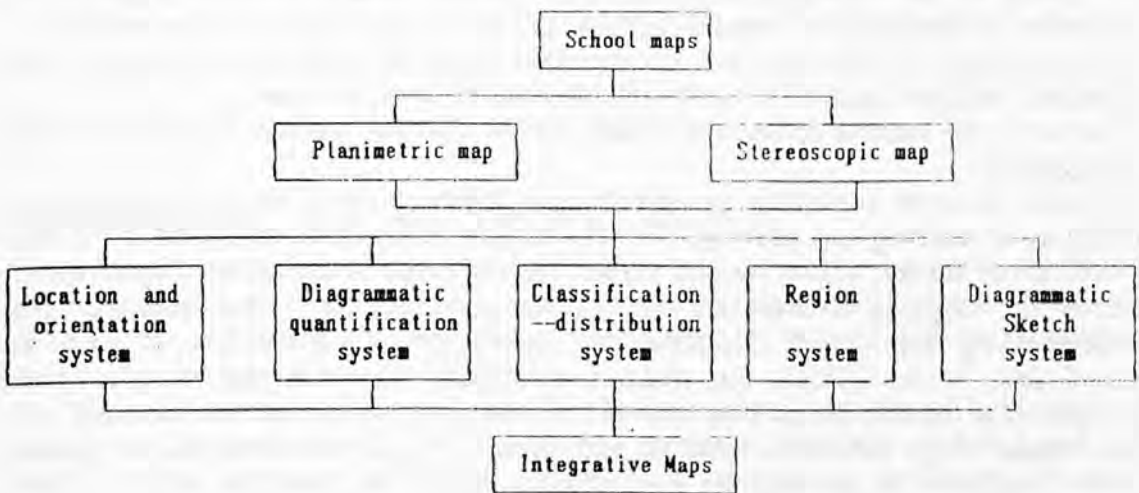
Fig.9   Classification on the School Maps

(1) Location and orientation (L&O) system.

Location and orientaton could be determined by geodetic surveying. In history people observed the natural world in varied points of view, so there are two distinct ways in measuring: one is from near to far, from the part to the whole; the other is from macrostructure to micromechanism, from the whole to the part. But in substance, both of them are only two different modes of thinking on the identical problem, both of them illustrate the nature of the same region only from the different viewpoint, both of them show only the different aspects of the identical system – the map.

For this reason, it looks as if the text book compilation is unreasonable to some extent: the same theme is divided into two separate ones, i.e. the whole L&O system is decomposed into the knowledge about the longitude and latitude which shows the macrostructure of the globe; and the knowledge about the map elements analysis which aims at the fundamental principles of map interpretation (scale, direction, legend and map lettering). These two parts are designated into different chapters in which non-L&O knowledges are mixed (i.e. the Earth in the universe, earth

movement, the classification on the tropic, temperate adn frigid zones, hypsography, etc.). Meanwhile, special interpretation on the transformation of the fictitious graticule, the map projection, appears after the text about the map elements analysis other than the longitude and latitude system.

Such arrangement inevitably cuts off the internal connections of the relevant knowledge, and further, students could not have the sense of the coherence within such isolated knowledge. The concept of "Location" and its characteristics would be obscure.

(2) Diagrammatic quantification system.

In teaching practice, quantificative concept could be displayed by diagrammatic methods, such as the pie graph, bar graph, line/curve graph, cumulating bar graph, etc.. But the isoline method is the speciality in geography category by which the consecutive changes of particular geographical elements could be quantified on spatial surface, such as the contour line and the depth curve, isotherm and the isohyet, the isobar and the isobaric surface, etc..

As each of the isoline map illustrates the distinct features of varied geographical elements, the interpretation should combine the map content with element analysis in different section. In that case, it is unreasonable to put the hypsography after the map elements analysis since there isn't any positive connection between them. On the other hand, the internal connection within the hypsography and the topography is cut and ignored.

Isoline method displaying the stereoscopic space on the plane map is always a difficulty in teaching and learning. Only the contour lines could correspond to the real landform or model, others would mainly depend upon imagination. Therefore to master the mapping theorem on drawing the contour map is the foundation for understanding the others. Because the knowledge in students' possession is insufficient, it is difficult for students to explain the real procedure of how geographical information is transformed from the real world and then inputted into the contour map. However, teaching and learning could just focus on the isoline method and how to interpret the contour map, that is the procedure of information expert only.

(3) Classification and distribution system.

Many particular geographical elements are described by both literal expression and the maps. Since geographical studies focus on the distribution of people, features and events over the surface of the earth and many of them are classified into different categories to make students' cognition more effective and systematic, map on classification and distribution is used frequently in textbooks. These are good opportunities to students to build up the concept of space!

For this reason, map interpretation would focus not only on particular element description but also on the concrete position and region/place. On the one hand, students could be impressed by the distributing location of specific elements, on the other hand, the concept of space could be strengthened. In fact, students usually pay attention to the individual cartographic symbols, legend, color, etc. as well as other diagrammatic representation in their special interest. These are only isolated end scattered information, not the reality the map shows. Moreover the map is the map only while character is only the literal symbol. Students could repeat the book but hardly use their own words to illustrate the map, let alone refer to special region/place.

Such phenomenon is a good evidence which means that the concept of space in students' mind is not integrate and effective. For example, after reading the map about the distribution of world cultivated lands, students could only know that "most of the cultivated lands distribute over the moist plain regions in the temperate zones" as it is concluded by the textbook. Unfortunetely, they do not have the consciousness to identify any of the concrete regions in the map after their scanning. In that case, the map about the classification and distribution are of double importance.

(4) Region system.

Regional studies start with identifying the location of the region. Then the focus of attention in regional geography study should start with analysing the significance and importance of the location. But usually, map interpretation in geography class tells the students only the location of a region. Although not every features are decided by the location, the human and natural landscape of a specific region is deeply influenced by its location. An example is showed by Fig.10 which illustrates the teaching process and the knowlwdge structure from which it could be realized that both the natural environment and the human creation reflect the influence and significance of the location, i. e. the internal relation among the spatial structure, the natural conditions and the human activities.

In conclusion, detailed map interpretation will contribute to students' cognitive activities especially the perception on the space-time continnum.

Exploring a More Reasonable Knowledge Structure

Geographers understand the interrelation and interaction within, between and among each geographic element, both human and natural respects. It has taken a rather long long time in human intelligence history to get such systematic and comprehensive knowledge through practice and trials.

When in education, students could hardly have the opportunity of field practice, so their cognitive activities could be majorly on the basis of the symbol world, not the real objective world. On the other hand, time allocation to geography subject is limited. It would be a miracle to shrink such a long historical period of human's exploration in geographical field into a brief class-hour. For this reason students' learning will be greatly influenced by the knowledge order presented in the textbook.

If textbook compilation shows the correct cognitive order of human perception on the geographical environment, students will follow a succeessful way to understand the interrelation within the content of courses first, and then to promote their awareness of thinking like a geographer to appreciate the real objective world.

Unfortunately, textbook compilation always focus on building a systematic structure, thus every ecosystem and socio-system could concentrate in the independent chapter to show the comprehensive ideas of certain field while the cognitive order is neglected. In education practice, such arrangement might lead up to chaos. On the one hand, the unknown concepts appear in the text before they are explained in the following texts. On the other hand, every system in textbook is an isolated chapter without any relation. Students will be puzzled at jumping from one chapter to another, they could hardly realize the interrelation within and between thosse chapters, let alone the systematic knowledge structure or furthermore, the interrelation and interaction of each geographical element in the real objective world.

Territory outline — Tortuous coastline — Favorable harbor conditions

Urban and industry distribution

Resoouces scarcity — Resources Materials import

Territory composition — Island country; limited territorial area

Limited market — Industrial products export

Industrial sectors structure

Sea-land relative location — East part of Eurasia; surrounded by the sea

Rich in forest resources; high percentage of forest cover

Location

Maritim monsoon climate

Short river length and torrential flow; rich in water power resources

Absolute location — Middle latitude region

Agricultural features : intensive and meticulous cultivation; high per unit area yield; small size agricultural machinery

Topographical features mountain in majority

Eurasia Plate

Plate tectonic (position)

Bordering region

Pacific Plate

Frequent earthquakes and volcano activities

Oceanic circulation (positon)

Kurile Cold Current

Hokkaido Fishery — Developed fishery

Japan Warm Current

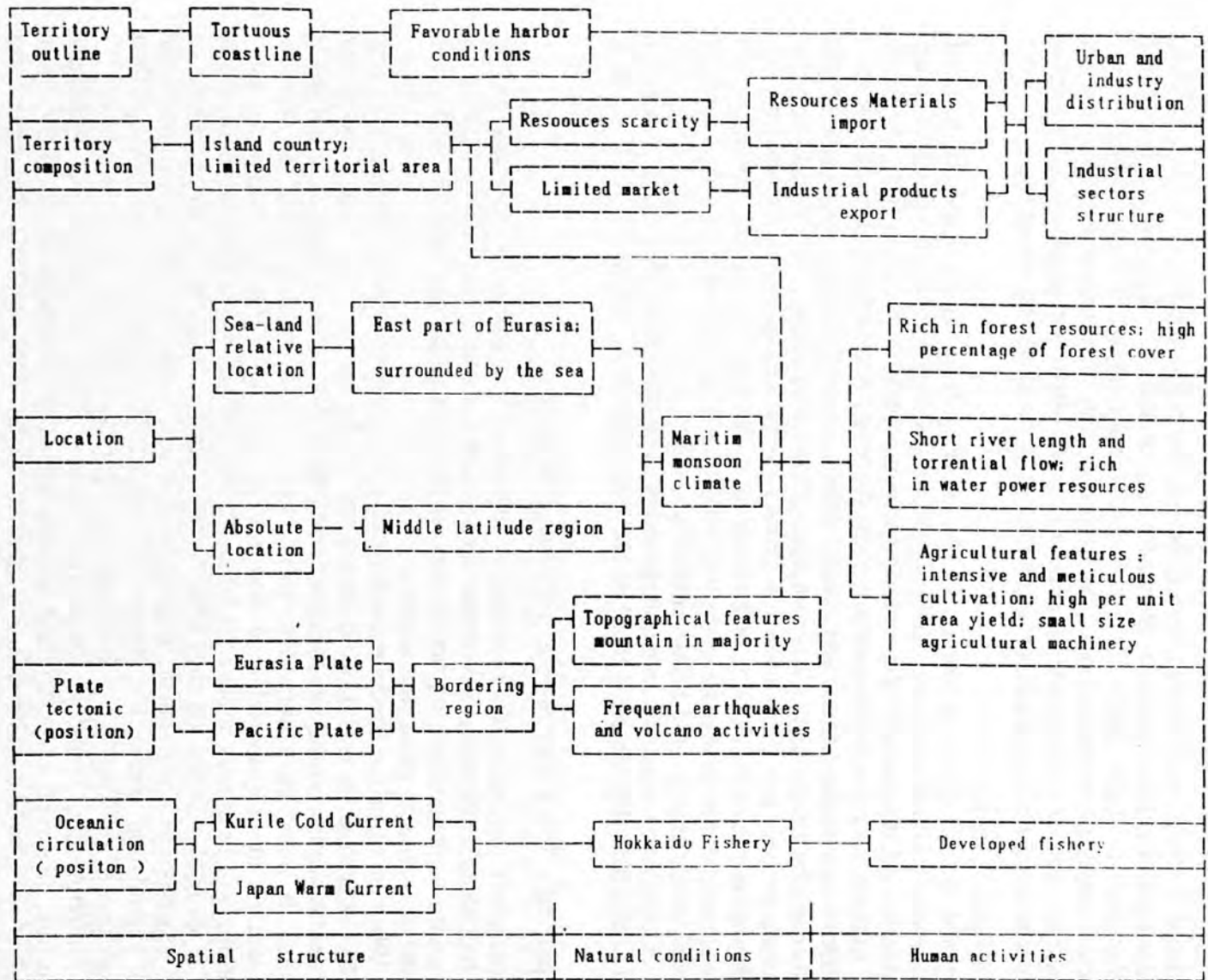Spatial structure | Natural conditions | Human activities

Fig. 10   Interpretation on the geographical environment of Japan

Fig. 11 Sketch map on the relationship between geographic cognitive process and geographical knowledge system for junior high schools
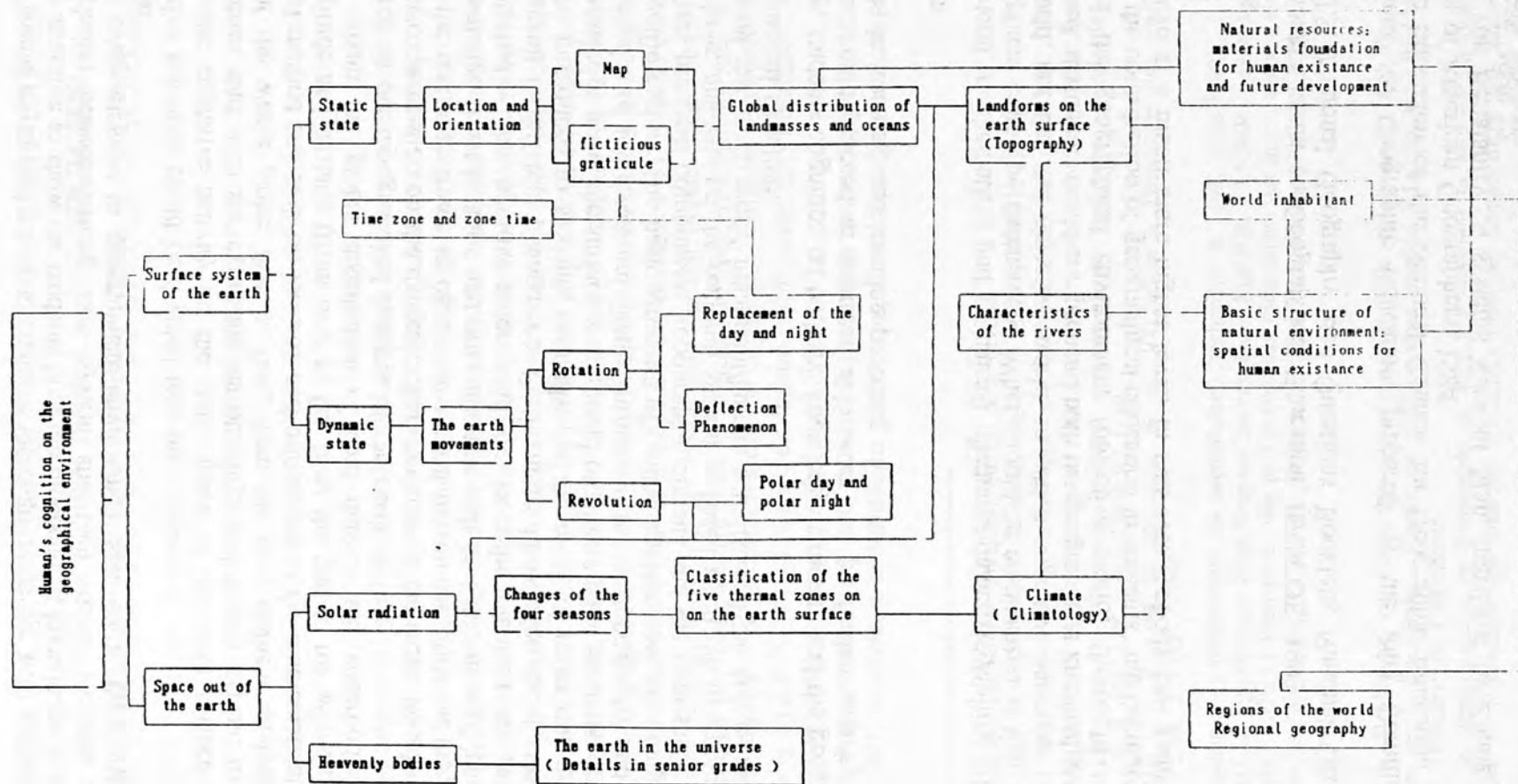
Fig.11 would try to find a way to combine the cognitive order with the systematic knowledge structure to show the students both the independent knowledge system and the interrelation between/among each system and then enable students to both understand every element in geographical environment and realize their interaction/interrelation.

The cognitive activities could be divided into three orders:

- Order one: cognitive activity on the static space of the earth surface system. Discoveries start with surveying the surroundings and further expand to a wide view of the whole globe, that is, first, from the map element analysis about essential method and skill on location and orientation to the mathematical system of longitude and latitude (from near to far, from the part to the whole); second, discuss about the global distribution of land masses and waterbodies; third, recognize on the topographical features of the earth surface.
- Order two: perception on the dynamic characteristics of the earth. People take the sun as the reference frame to observe the earth movement while on the basis of the knowledge about location and orientation as well as distribution of landmasses and waterbodies, the cognitive order could start from the rotation to the revolution which result in different phenomena. Furthermore, knowledge about climatology could be introduced to students naturally. As the result of order one and order two, knowledge about the surface water could be illustrated to students, especially, characteristics of the rivers are deeply influenced by the topography and climate in a specific region. The basic structure of natural environment are composed by these three principal components, topography, climate and the river/surface water.
- Order three: analysis on the regional system is based upon the interpretation on the natural resources, world inhabitant/human activity, and the above- mentioned environmental structure.

In this way, students cognition on both the knowledge structure and the geographical environment could proceed in an reasonable order and go further step by step to avoid chaos in teaching and learning process.

Conclusion

Symbol (literal, mathematicel and graphical) phenomenon/activity/ability influenced the geographical cognition extensively. What should be emphasized is that it is the symbol world, not the real objective world, in which cognitive activities could be accomplished. If students could comprehend both the geographical knowledge (symbol world) and the geographical environment (objective world) thoroughly through education, the contribution of geographical education to students' intellectual abilities could achieve at a much more higher level. In that cese, nobody can gainsay such fact!

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FORMER LES PROFESSEURS AUX DIDACTIQUES DES DISCIPLINES PAR LA RECHERCHE: UNE FORMATION PROFESSIONNELLE DISCIPLINAIRE

Lucile Marbeau

En ce dernier quart du XXe siècle, la formation est devenue essentielle : préparer les jeunes aux métiers nouveaux et les engager dans une formation permanente, développer la formation continuée tout au long des carrières afin d'améliorer les compétences des divers professionnels... Ce constat s'applique au métier d'enseignant: le système éducatif, en France comme ailleurs, se modifie de plus en plus dans un monde en rapide et profond changement, de la société aussi bien que des sciences et techniques. Devant l'urgence et les mutations, il ne saurait être question de simples améliorations; c'est pourquoi la formation est à l'écoute de la recherche, les formateurs ayant même pour vocation à devenir chercheurs dans leur champ d'action.

Depuis 1968, environ, des recherches ont été conduites à l'I.N.R.P. en didactiques des diverses disciplines et depuis 1980, mais surtout depuis 1983, des **"recherches en formation permanente (initiale et continuée) des enseignants aux didactiques par la recherche"**[1] Ces dernières ont été organisées, animées, coordonnées, dans le cadre de la M.F.P.R.[2] de l'I.N.R.P. en liaison étroite avec une trentaine d'équipes de formateurs-chercheurs dans quinze académies.

Nous analyserons ici ce qu'a montré et produit la recherche M.F.P.R. n 191 de 1988 à 1991 concernant la formation professionnelle des professeurs aux didactiques

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[1] Les principales recherches évoquées ont eu pour objet:
- **la formation des instituteurs** (recherches n°2 116 et 117, 1984-1990):
MARBEAU L. : publication de deux Rapports intermédiaires M.F.P.R - I.N.R.P., 1987 et 1989,
MARBEAU L. (Dir.) : Des didactiques dans tous leurs écarts : formation des instituteurs aux didactiques de l'histoire, géographie, sciences sociales par la recherche - collection Rencontres Pédagogiques, n 26, 128 pages, I.N.R.P., 1989,
MARBEAU L. : Rapport de recherche n 3, 100 pages - Formation des instituteurs aux didactiques... id., I.N.R.P., 1990.

- **La formation des professeurs du secondaire** (recherche n 191, 1988-1992):
MARBEAU L. : publication d'un Rapport intermédiaire M.F.P.R. - I.N.R.P., novembre 1990,
MARBEAU L. (Dir.) : Formation des professeurs aux didactiques par la recherche : une formation professionnelle "disciplinaire", D.F.M., Département des Didactiques, I.N.R.P., 1992.

[2] M.F.P.R.
"Mission de Recherche en Formation Permanente (initiale et continue) des Enseignants aux Didactiques par la Recherche", fondée en 1983 et alors confiée à Lucile MARBEAU, Maître de Recherche, Directeur de Programme.
Fin 1990, la réorganisation de l'ensemble de l'I.N.R.P. amenait la M.F.P.R. à devenir l'Unité "Didactiques et Formation des Maîtres" (D.F.M.) dans le Département des Didactiques des Disciplines.

de l'histoire, géographie, sciences sociales. Mais il est d'abord indispensable de définir les termes utilisés (professeur, didactique, formation aux didactiques des disciplines, formation par la recherche, formation professionnelle disciplinaire) et les compétences attendues par ce nouveau type de formation professionnelle.

Rappelons brièvement le **dispositif officiel** de formation des enseignants français en 1992. Depuis septembre 1991, ils sont recrutés dans les Instituts Universitaires de Formation des Maîtres (I.U.F.M.) sur la base de la licence obtenue après trois années d'études universitaires. La première année, ils préparent un concours de recrutement, diversifié selon qu'ils sont candidats à l'enseignement dans les écoles maternelles et primaires, d'une part, les collèges et lycées, d'autre part. Après leur réussite ils effectuent à l'I.U.F.M. et dans les classes une formation professionnelle de un an avant de devenir professeurs titulaires d'un poste. Tous auront donc une **formation universitaire longue**, "bac + 5", et le titre de **professeur.** L'agrégation a été maintenue et elle est préparée dans les universités pour les candidats titulaires de la maîtrise.

Auparavant, l'appellation de **professeur** ne concernait que les enseignants du Secondaire et du Supérieur, les maîtres des Ecoles étant alors des "instituteurs", aux études spécifiques et moins longues. La réforme étant tellement récente (ouverture des I.U.F.M. en 1991-92), la situation du personnel enseignant n'a pas encore changé sur le terrain. Au collège et au lycée les professeurs sont **certifiés** (bac + 5) ou **agrégés** (bac + 6)[3] ; ces normes sont en fait théoriques car elles impliquent la réussite à tous les examens et concours sans échec depuis le baccalauréat. Les concours étant sélectifs, surtout l'agrégation, nombre de professeurs ont donc effectué beaucoup plus de cinq ou six années d'études universitaires. Des **maîtres auxiliaires** exercent dans le Secondaire à titre de remplaçants (ils sont licenciés ou titulaires d'une maîtrise). De nombreux P.E.G.C. (Professeurs d'enseignement général de collège) exercent encore dans le premier cycle secondaire : leur recrutement a été arrêté en 1987-88. Ils devaient être titulaires du D.E.U.G. (les deux premières années universitaires) avant de se présenter au concours de recrutement des Centres de Formation de P.E.G.C., annexés aux Ecoles normales, et ils y effectuaient deux années de formation professionnelle.

Notre recherche sur la formation des **professeurs** aux didactiques de l'histoire, géographie, sciences sociales, a concerné des certifiés et agrégés-stagiaires, en **formation initiale** au Centre Pédagogique Régional (C.P.R.) de 1988 à 1991 et en I.U.F.M. en 1991-92, ou des professeurs du Secondaire en cours de carrière et maîtres auxiliaires volontaires pour s'engager dans des actions de **formation continuée** organisées par les Missions Académiques à la Formation des Personnels de l'Education Nationale (M.A.F.P.E.N.). Si les I.U.F.M. ont remplacé les Ecoles normales d'instituteurs et les C.P.R. pour la formation initiale, les M.A.F.P.E.N. continuent à offrir les actions de formation continuée. La définition des concepts et expressions clés permettra de clarifier aussi les objectifs donnés et les compétences attendues.

Le mot **didactique** est entré dans le vocabulaire courant. Et pourtant, le concept ne recouvre pas toujours le même sens, les mêmes réalités dans les esprits et ne

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[3] **Les certifiés** ont été admis au Certificat d'Aptitude au Professorat de l'Enseignement Secondaire (C.A.P.E.S.).
Les **agrégés** ont été reçus à l'Agrégation.

donne pas encore lieu aux mêmes pratiques, hier dans les C.P.R. et les M.A.F.P.E.N., aujourd'hui dans les divers I.U.F.M. La recherche I.N.R.P. qui s'est déroulée a eu pour but de fournir à l'Institution, un modèle, des outils, des démarches... expérimentés et validés afin de contribuer à l'amélioration et l'homogénéisation de la formation des maîtres. Nous assistons déjà à un rapprochement certain des points de vue et des pratiques tant en formation initiale ou continuée que dans le cadre des C.A.P.E.S. et agrégations internes.[4]

En dehors des centres de formation et de certaines universités, le mot **didactique** demeure encore flou, voire inquiétant (?) : ... "c'est un mot fabriqué pour renouveler celui de pédagogie"... "il a été inventé une nouvelle matière pour enlever aux étudiants et professeurs l'enseignement de vraies disciplines"... Pour quelques uns enfin, et de plus en plus rares, le mot didactique est un **adjectif**, mais tout aussi négatif : "les exercices didactiques" en classe ne seraient que des modèles fermés, répétitifs, mécaniques et incapables d'introduire des activités mentales personnelles pour celui qui apprend. Signification de la fin du XIXe siècle, elle a pratiquement disparu.

Autant de contresens qui pourraient être évités si l'information et la formation pouvaient atteindre tous les enseignants. Il faut aussi du temps pour intérioriser, admettre et mettre en oeuvre l'innovation et remettre en question ses représentations.

Du reste peu d'articles définissent l'expression **"didactiques des disciplines"**.

En 1978, G. Vergnaud[5] écrivait:

"il faut écarter tout schéma réductionniste : la didactique n'est réductible ni à la connaissance d'une discipline, ni à la psychologie, ni à la pédagogie, ni à l'histoire, ni à l'épistémologie. Elle suppose tout cela ; elle ne s'y réduit pas ; elle a son identité, ses problèmes, ses méthodes. C'est maintenant un point acquis pour les chercheurs qui se sont engagés dans cette voie".

En 1983, le même auteur[6] précisait:

"... contrairement à certaines idées reçues la didactique ne vise pas seulement à trouver les meilleures méthodes ou de nouvelles techniques pour enseigner un contenu donné à l'avance ; elle peut remettre profondément en cause les contenus d'enseignement : ceci pour des raisons diverses liées aux finalités de l'enseignement, au développement de l'enfant et de l'adolescent, à l'épistémologie du domaine considéré ou à l'évolution des qualifications de notre époque".

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[4] Les concours de recrutement des professeurs du Secondaire sont dits externes (C.A.P.E.S. et agrégations) lorsqu'ils sont ouverts aux étudiants ou, d'une façon générale, à des personnes n'étant pas titulaires d'un poste dans l'enseignement. Les concours internes, créés depuis quelques années, sont au contraire réservés à des personnels déjà en poste et aux maîtres auxiliaires justifiant de cinq années d'ancienneté de services et des titres universitaires requis.

[5] VERGNAUD G. : Revue Française de Pédagogie, n° 45, I.N.R.P., 1978

[6] VERGNAUD G. : in Rapport Carraz, Education et socialisation de l'Enfant, Documentation Française, 1983

... "La didactique d'une discipline a pour objet d'étudier les processus de transmission et d'appropriation des connaissances, dans les aspects pratiques et théoriques de la connaissance, qui sont spécifiques du contenu".

C'est ainsi que l'on distingue la didactique des mathématiques, la didactique du français, la didactique de l'histoire, celle de la géographie...

..." L'utilisation la plus directe et la plus importante de la recherche en didactique est sans aucun doute la formation des maîtres, ce qui implique qu'on lui accorde une place importante dans les centres de formation"...

Ce n'est donc pas par hasard qu'est fondée à l'I.N.R.P. la M.F.P.R., en 1983. Bien avant, du reste, les Instituts de Recherche sur l'Enseignement des Mathématiques s'étaient développés dans chaque académie, dès la fin des années 60 (I.R.E.M.). Ils ont groupé des professeurs et des chercheurs volontaires conduisant réflexion, expérimentation et recherche, contribuant largement à l'avance prise par la didactique des mathématiques. En 1985, Y. Chevallard[7] publie un ouvrage qui est venu alimenter notre propre réflexion en histoire, géographie, sciences sociales: ... *"un contenu de savoir ayant été désigné comme savoir à enseigner subit dès lors, un ensemble de transformations adaptives qui vont le rendre apte à prendre place parmi les objets d'enseignement. Le travail qui d'un objet de savoir à enseigner fait un objet d'enseignement est appelé la transposition didactique"...*

Ainsi, **la formation des professeurs aux didactiques des disciplines** implique une bonne **formation scientifique** (dans le domaine des disciplines de l'enseignement secondaire dont ils seront responsables et auxquelles ils sont sérieusement initiés : licence et maîtrise universitaires, concours de haut niveau), une **mise à jour permanente** de ces savoirs de référence et l'acquisition de **compétences complémentaires essentielles** : celles qui vont leur permettre de prévoir, mettre en oeuvre, observer, comprendre, évaluer, les processus de transmission et d'acquisition des connaissances. La formation aux didactiques les y prépare par un va-et-vient constant entre théorie, pratiques et théorisation des pratiques. Dans cette formation au métier, il y a des relations et interrelations constantes entre ce qui est apporté par les formateurs du "centre" et ce qui se passe dans les classes entre le professeur stagiaire et les élèves et au contact des formateurs de terrain, tuteurs et conseillers pédagogiques. Le professeur stagiaire doit maîtriser les savoirs scientifiques (= de référence) et être apte à rendre les "savoirs à enseigner" (c'est-à-dire les programmes officiels) utilisables en tant que matière d'enseignement pour les élèves qui leur sont confiés. Les **transpositions didactiques**, qu'ils vont sans cesse effectuer, nécessitent la prise en compte aussi précise que possible des réalités très diverses des élèves concernés : il s'agit, quels que soient les élèves, de **maîtriser les processus d'enseignement et d'apprentissage** de façon optimale.

Il n'est donc pas question "d'enseigner les didactiques à la place des disciplines" : non seulement on n'enseigne pas les didactiques des disciplines aux élèves, mais il n'est pas question que les formateurs le fassent au cours de la formation des maîtres. Ils utilisent les produits de la recherche en formation des enseignants aux didactiques (modèle de formation, nombreux outils, stratégies, démarches...) qui sont des leviers, des vecteurs, permettant au professeur-stagiaire de comprendre les

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[7] CHEVALLARD Y. : La transposition didactique, Edition La Pensée Sauvage, Grenoble, 1985

objectifs professionnels poursuivis et d'acquérir les compétences indispensables à son métier. De même, le professeur formé aux didactiques utilisera problématiques, outils, supports informatifs... afin de faire acquérir à ses élèves savoirs conceptuels et factuels, méthodologie, attitudes...

Si le professeur-stagiaire est aidé en formation initiale par le formateur didacticien à **faire la synthèse** de ses nouveaux acquis professionnels, c'est la **formation par la recherche** qui est la plus efficace et durable.

Cette notion de formation par la recherche a parfois fait sourire : "Comment voulez-vous faire de tous les enseignants des chercheurs ?" Il ne s'agit pas certes pas d'engager tous les professeurs-stagiaires dans une recherche fondamentale au nom des progrès nécessaires de la formation. Par contre, il s'agit bien d'en faire des praticiens-chercheurs, des enseignants qui s'interrogent sur les disciplines à enseigner, les possibilités et personnalités des élèves, les pratiques dans la classe, l'utilisation opérationnelle d'outils d'observation et d'évaluation, la formulation de problématiques scientifiques et pédagogiques... Le professeur-stagiaire a besoin de s'intégrer à la formation aux didactiques **par** la recherche afin d'être **capable**, dans le cadre des textes officiels et des finalités du système éducatif:
- d'expliciter et de justifier les objectifs d'apprentissage qu'il propose;
- de les communiquer aux élèves;
- d'établir un itinéraire pédagogique annuel cohérent face aux programmes et instructions officiels;
- de définir une problématique scientifique (choix des contenus scientifiquement pertinents) et une problématique didactique: choisir des fils directeurs et des contenus adaptés à ses élèves;
- de choisir les supports pédagogiques cohérents et adaptés aux élèves et aux contenus retenus;
- d'observer et évaluer ce qui se passe en classe:
  recueillir des informations sur les élèves au travail, les utiliser de façon formative, les comptabiliser de manière sommative;
  et prévoir les réajustements indispensables pour les leçons à venir.

Afin d'être apte à réaliser toutes ces analyses et le traitement des données, le professeur débutant a besoin d'y avoir été initié par une formation professionnelle disposant de stratégies, d'outils et de démarches de recherche, réutilisables lorsqu'il sera seul en classe ou, mieux, membre d'une équipe d'établissement.

Du reste, les apprentissages réalisés avec des attitudes et des démarches de recherche sont les plus féconds, aussi bien pour les élèves que pour les adultes : le grand psychologue américain, J-S. Bruner[8] insiste dès 1959, dans son livre "The Process of Education" sur le fait que "les enfants du troisième grade" (en France, ceux de 8-9 ans au cours élémentaire deuxième année) sont aptes à apprendre par la recherche, par d'authentiques activités mentales de questionnement, observation, mises en relation..., que les situations-problèmes sont les plus fécondes pour leur développement cognitif et les plus durables pour l'acquisition du savoir. L'enfant (et l'adulte en formation) **construisent** leur savoir. Bruner affirme que **"connaître est un processus, non un produit"** : "comment s'élabore la connaissance ? la manière dont se structurent les cadres de la pensée, que sont les notions et concepts? ... "Ce sont

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[8] BRUNER J-S. - The Process of Education, University Press, Harvard, 1959

les réseaux conceptuels qui donnent des moyens de compréhension du monde qui nous entoure...".

Faut-il revenir sur le fait que notre formation aux didactiques par la recherche est une **formation professionnelle disciplinaire** ? Le modèle habituel (et trop souvent encore utilisé) de formation des enseignants est singulièrement dépassé : il y a **d'abord** des apprentissages disciplinaires (souvent de bonne qualité) réalisés à l'université par les étudiants **puis ensuite**, après le concours théorique de recrutement, une "formation pédagogique", une série d'informations utiles mais disparates : un peu de sciences de l'éducation, des conférences de psychologie, de sociologie, de psycho-pédagogie, l'initiation au maniement du projecteur, de l'épiscope, du rétroprojecteur et, plus récemment, à l'utilisation de quelques techniques modernes d'éducation (informatique, vidéodisque, télédétection...). Certes, tout professeur devrait non seulement savoir se servir de tous ces instruments, supports et documents, mais intégrer réellement leurs possibilités pour favoriser les apprentissages des élèves et les diversifier.

Même si de grands progrès ont déjà été réalisés, le problème demeure encore que toutes ces formations et informations se présentent sans assez de liens entre elles, les divers spécialistes apportant des savoirs cloisonnés et la **synthèse** devant donc être réalisée par le professeur-stagiaire lui-même. Or c'est bien à réussir un **embrayage** permanent entre contenus disciplinaires et possibilités des élèves que doit se livrer le professeur en classe pour de véritable **actions didactiques.**

La **formation aux didactiques par la recherche** permet au jeune professeur de faire une **synthèse active** avec l'aide du **didacticien** : c'est une formation profession-nelle disciplinaire, axée sur ceux qui apprennent, c'est-à-dire les professeurs stagiaires qui vont eux-mêmes mettre en pratique de façon systémique l'ensemble de leurs acquis, dès les semaines de stages qu'ils effectuent dans les collèges et les lycées.

La création des **I.U.F.M.** devrait à cet égard permettre de généraliser plus tôt une sensibilisation aux didactiques des disciplines (y compris une prise de contact avec le "terrain" c'est-à-dire les classes) dès l'année de préparation au concours. Dans certaines universités, et depuis plusieurs années déjà, des Unités de Valeur en didactiques des disciplines sont proposées aux futurs enseignants pendant la licence.

Cette formation professionnelle des professeurs aux didactiques des disciplines vise aussi à les rendre conscients de leurs représentations et de la possibilité de les faire évoluer et, par la théorisation des pratiques, à les rendre aptes à analyser leurs pratiques. En début de l'année de formation professionnelle, les formateurs-chercheurs didacticiens des équipes de recherche I.N.R.P. utilisent un questionnaire sur les **représentations que les stagiaires ont des disciplines et de leur enseigne-ment** : cela permet une prise de conscience des intéressés et une introduction à la réflexion épistémologique. Tout au long des stages pratiques, ces mêmes didacticiens-chercheurs les ont amenés à analyser leurs pratiques, à réfléchir face à la discipline, aux élèves et à leur action personnelle. Les objectifs prévus ont-ils été atteints ? Si oui, contenus et méthodes utilisés étaient bien adaptés aux élèves concernés et la compétence du professeur était suffisante. Le travail prévu, au contraire, n'a pas été terminé. Pourquoi ? les contenus prévus étaient-ils trop lourds pour les élèves ? la stratégie peu performante ? avait-on pris en compte les pré-acquis des élèves ? (difficile de bâtir sans utiliser ce qui est déjà connu). Le niveau de connaissances impliquait-il obligatoirement une formation antérieure des élèves (pré-requis) qui n'avait pas été suffisamment mise ne place? ...

A tout moment, les contenus disciplinaires doivent donc être mis en relation avec les éléments psycho-cognitifs et affectifs, psycho-pédagogiques et sociologiques : impossible de séparer contenus, méthodes et réalités complexes concernant les élèves pris individuellement et en groupe. Le formateur-DIDACTICIEN est un **spécialiste d'une discipline** ; il n'est pas le seul à former les professeurs stagiaires ; il est de niveau universitaire comme ses collègues psychologues et sociologues. Il a intégré dans sa propre formation non seulement un haut niveau de qualification disciplinaire mais aussi l'essentiel de ce qui concerne la formation générale, il est le mieux placé pour aider les professeurs stagiaires à faire la synthèse des informations reçues et des connaissances acquises au contact des autres spécialistes de champs divers. Plus l'ensemble des formateurs du "Centre" et du "terrain" constituent une véritable équipe en constante concertation, plus les stagiaires deviennent aptes à réaliser cette synthèse indispensable.

Les termes et les compétences attendues à l'issue de cette nouvelle formation ayant été longuement commentés, il reste à **présenter le dispositif, les processus et les produits de la recherche en formation des professeurs aux didactiques de l'histoire, géographie, sciences sociales.** Les limites de cet article ne permettent pas de publier les textes du modèle et les outils créés et utilisés par les équipes de recherche : on les retrouvera dans les publications de l'I.N.R.P.[9] et aussi dans les Actes de la Commission Internationale Enseignement de la Géographie (27e Congrès de l'U.G.I. ; Brisbane-Sydney, 1988).

Afin de rendre non seulement les produits, démarches, synergies, transférables, utilisables quel que soit le système éducatif concerné, nous avons opté pour un **dispositif de recherche** qui reprenne la réalité institutionnelle de la formation des enseignants, en France. Les **équipes de recherche** I.N.R.P. ont donc été formées de **formateurs volontaires de tout statut**, représentant la réalité **intercatégorielle** : professeurs-formateurs, universitaires intervenants, Inspecteurs Pédagogiques Régionaux, conseillers pédagogiques et tuteurs, c'est-à-dire l'ensemble des formateurs du "Centre" et du "terrain". Afin de rendre l'expérimentation et l'évaluation significatives, huit équipes ont été constituées, représentant des formateurs de huit académies (sur 27) et les responsables de huit autres académies ont accepté de forme des équipes "témoins" (en vue de l'évaluation).

Un modèle de formation systémique, ni linéaire, ni chronologique, a été créé par les chercheurs, expérimenté, amendé, puis opérationnalisé en 1989-90. **Ses trois pôles:**
– rendre le formé acteur de sa formation,
– conduire avec le formé une réflexion épistémologique,
– conduire le formé à l'action didactique,
sont en interaction permanente ; ce modèle est un tableau d'objectifs; les objectifs intermédiaires et opérationnels ayant été minutieusement rédigés, des situations et tâches possibles d'apprentissage ont été indiquées en regard de ces derniers ainsi que des listes de supports et outils utilisables.

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[9] Voir les références dans la note n 1 de la première page de cet article ainsi que les Actes des Colloques I.N.R.P. annuels (1986-1992) sur les Didactiques de l'histoire, géographie, sciences sociales. Voir en particulier les Actes du cinquième colloque international : "Enseigner l'histoire, la géographie, les sciences sociales : quelle (s) formation (s) ? pour quel métier ?", I.N.R.P., 14-16 mars, Paris, 1990

Chaque ensemble d'objectifs opérationnels de formation est ainsi facile à choisir, à reformuler par chacun, à compléter ou élaguer selon les besoins du groupe de stagiaires et à mettre en oeuvre de façon souple, logique et concrète. Ce **modèle** n'est pas coercitif : il est **systémique et flexible**. Toute entrée conduit à la prise en compte concomitante des trois pôles définis : les formés, les contenus, l'action didactique. Le groupe de recherche I.N.R.P. a, par la concertation, la réflexion théorique, l'expérimentation et l'évaluation, rendu le modèle vraiment opérationnel pur 1990-91 (et 1991-92 : évaluation de la recherche) tout comme les outils associés. Il a fonctionné dans les huit I.U.F.M., ayant remplacé les C.P.R. liés à la recherche, pour la formation des professeurs-stagiaires reçus aux concours de 1991 : la formation aux didactiques par la recherche y a été conduite en histoire, géographie, sciences sociales par les équipes I.N.R.P. sans plus de difficultés que dans les anciens C.P.R. ou, à tout le moins, en les surmontant de façon positive.

Nous avions fait l'**hypothèse** que notre **modèle** était **transférable**, utilisable avec flexibilité dans **toutes les situations institutionnelles**. Nous avions aussi fait l'**hypothèse** qu'il serait **utilisable par les didacticiens des autres disciplines** d'enseignement, à la condition que les outils soient **spécifiés**. Un premier modèle (dont est issu celui qui a été enrichi pour la formation des professeurs) avait fonctionné dans les équipes de recherche I.N.R.P. des anciennes Ecoles normales en 1985-89 pour l'histoire, géographie, sciences sociales mais aussi, de façon plus empirique avec des professeurs-formateurs volontaires en didactique du français et dans celle des sciences naturelles. Il reste à prouver par la recherche que ce modèle peut servir de structure de base pour la formation aux diverses didactiques. Cela semble a priori possible.

Le modèle a permis à chaque équipe d'historiens et géographes du "centre" et du "terrain" et en concertation avec d'autres formateurs, dans la mesure du possible, de retenir chaque année un **itinéraire de formation aux didactiques**. L'ensemble du groupe de recherche s'est mis d'accord sur les **passages obligés** induits par le modèle et indispensables à la formation :

– la prise en compte des représentations,
– la réflexion épistémologique, c'est-à-dire sur la discipline, sa logique, ses méthodes... son évolution...
– la préparation des sujets d'étude : expliciter une problématique, dégager des objectifs notionnels...
– la théorisation des pratiques, la réflexion didactique, l'appréciation des écarts qui résultent des transpositions didactiques du savoir savant au savoir enseigné en classe.

Chaque année de recherche, nous avons constaté que les équipes ont utilisé la rigueur, la cohérence et la flexibilité du modèle puisque chaque équipe a créé et expérimenté un itinéraire de formation original et pourtant homologue de ceux des sept autres équipes (respectant en particulier tous les "passages obligés"). Les formateurs-chercheurs ont prouvé une autre hypothèse : un modèle **rigoureux**, **cohérent** et **flexible**, un tableau d'objectifs systémique, ne saurait être un carcan ; il conduit les formateurs à utiliser pleinement leur **liberté** et leur **responsabilité** face à des groupes de professeurs-stagiaires obligatoirement différents d'une académie à l'autre.

Les principaux outils de formation et de recherche créés par le groupe I.N.R.P. et utilisés au cours de l'itinéraire annuel de formation. Nous citerons :

– le **questionnaire sur les représentations**, traité de façon scientifique et anonyme (même si les noms des stagiaires y figurent compte tenu de la pratique du retest de fin d'année). Lors des derniers amendements, en juin 1990, il y a eu un souci de grande rigueur quant aux références épistémologiques sous-jacentes à bien des items. Les énoncés d'histoire ont été choisis dans des ouvrages d'historiens universitaires (tous les formateurs-chercheurs ayant les références précises de leur origine). Quelques items, au contraire, relèvent du sens commun. **Une utilisation pédagogique** des réflexions relevées a été proposée, en début de stage, à partir des réponses les plus fréquemment exprimées par le groupe de professeurs-stagiaires. Le retest de fin d'année visait à **apprécier l'évolution des représentations**. Les chercheurs ont constaté d'importants changements : il sera impossible de savoir s'ils correspondent vraiment à des modifications personnelles ou si certains stagiaires n'ont pas voulu "faire plaisir au formateur". Il faudrait avoir le temps et les moyens de vérifier par des entretiens semi-directifs. De toute façon, il apparaît essentiel que les stagiaires aient eu conscience de la logique des représentations face à l'évolution des disciplines et à la formation aux didactiques, qu'ils aient jugé nécessaire d'exprimer une évolution de leur pensée, même si leurs représentations premières demeurent souvent "tenaces" dans les esprits;

– le **dossier didactique** a été utilisé en formation **initiale** et participe de l'organisation de la formation par **alternance**. Il s'est intégré dans le processus de formation et a constitué un élément d'évaluation intermédiaire dont les critères étaient les mêmes que ceux retenus pour l'évaluation terminale ("E.Q.P." des C.P.R.). Le dossier didactique comportait deux parties : la première en histoire **ou** géographie, terminée en fin de premier trimestre avec l'**aide du conseiller pédagogique** ; la deuxième, dans l'autre discipline, en **autonomie complète** (pour la fin du deuxième trimestre) et corrigée par les formateurs-chercheurs didacticiens.

Ce dossier a ainsi permis d'intégrer de fait les conseillers au processus de formation et de favoriser l'évaluation **formative**. **Trois outils** adaptés ont accompagné le dossier didactique: ils avaient été communiqués aux stagiaires dès le début de l'année scolaire:

une fiche de préparation et d'analyse a posteriori d'une leçon-séquence ;

une grille d'observation, de préparation et d'analyse didactique d'une leçon-séquence ;

une grille d'évaluation du dossier didactique d'histoire et de géographie;

- **un questionnaire pour l'observation du processus de formation:** analyse de séance de formation "au centre", analyse des processus. Ce sont des formateurs-chercheurs qui les ont remplis en assistant aux séances de formation conduites par leurs collègues

- **un questionnaire destiné à recueillir les appréciations portées par les stagiaires** sur la journée de stage du...

Le formateur comptabilise les appréciations et en fait la synthèse avant d'ouvrir une discussion avec le groupe des professeurs-stagiaires;

- **une grille d'observation des professeurs-stagiaires en classe.**

Au départ ont été consignés les **critères d'évaluation** à retenir pour l'**examen de qualification professionnelle** : une longue et générale concertation de l'ensemble des formateurs-chercheurs a permis d'y parvenir en octobre 1989. Puis une **grille de recueil des données** a été créée et complétée par la **liste des indicateurs explicitant les critères et les niveaux retenus**. Il s'agissait, en effet, de recueillir des données

cohérentes et pertinentes pour l'ensemble des professeurs stagiaires en formation avec les équipes I.N.R.P. de huit académies.

Pour chaque **observation à cocher**, il y a quatre ou cinq niveaux possibles de compétence du stagiaire. Donnons un exemple. **Concernant "problématiques et contenus"**, on a retenu **"l'observation de la pertinence scientifique"**:

1. L'erreur factuelle, notionnelle ou "l'incohérence" épistémologique rendent la séquence fausse ou obsolète.
2. Il n'y a pas d'erreur grave, mais les références scientifiques sont soit imprécises soit mal intégrées à la leçon.
3. Il n'y a pas d'erreur d'ordre épistémologique : les références scientifiques sont intégrées à la leçon.
4. L'enseignant a dressé un état de la question : son information n'est pas univoque.
5. Il est capable d'une mise en relation avec l'évolution de la discipline et la pensée scientifique.

Cet outil, assez lourd pour les formateurs-chercheurs, a été expérimenté plusieurs fois. En 1990, ils ont souhaité le rendre "transparent" pour les stagiaires. Il a donc, petit à petit, par morceaux, été utilisé au cours de l'année scolaire en **évaluation formative** de telle sorte que les stagiaires aient conscience du niveau de performances et de réflexion que l'on attendait d'eux au moment de l'évaluation terminale.

Cette grille d'observation au cours des heures de l'**évaluation terminale** des compétences du stagiaire a été utilisée aussi par les équipes "témoin". Certains items étaient à cocher pendant les activités effectuées avec les élèves, d'autres l'étaient au cours de l'entretien. L'ensemble des données recueillies a présenté un caractère beaucoup plus précis et objectif que la seule appréciation de l'examinateur ne disposant pas d'un tel outil.

Comme le modèle, ces outils divers sont utilisables par l'ensemble des formateurs. Mais ils sont modifiables et devraient être appropriés de façon critique. Nul doute qu'une formation "par la recherche" ne permette de les améliorer et de les adapter aux besoins d'un système éducatif destiné, comme ailleurs dans le monde, à une évolution rapide commandée par celle de la société.

Pour terminer, il convient de ne pas omettre une donnée importante, une conclusion issue de l'**observation du fonctionnement de notre groupe de recherche**. La réflexion théorique, la concertation permanente, la création, l'expérimentation, l'évaluation du modèle et des outils de formation professionnelle aux didactiques des disciplines, par la recherche, et le fonctionnement de notre dispositif ont constitué, de fait, un **modèle implicite de formation des formateurs de formateurs,** que l'on peut analyser a posteriori. Le groupe de recherche a fonctionné en réseau national, très largement fondé sur les pôles académiques des équipes, les publications et ventilation de l'information tout comme la coordination d'ensemble revenant à la "tête de réseau", chercheur I.N.R.P. Mais on n'insistera jamais assez sur le fait que les **relations non hiérarchiques**, en permanence, ont favorisé les travaux de tous, l'inventivité de chacun, toujours pris en compte lors des décisions intervenant en réunions nationales de recherche, décisions prises au consensus le plus élevé possible afin d'enrichir au maximum l'ensemble des activités du groupe. Combien de fois a-t-on posé ce problème de la formation des formateurs de formateurs ? C'est le problème insoluble de la poule et de l'oeuf ! Il ne peut y avoir que co-formation dans l'action de recherche.

Le va-et-vient constant entre réflexion et expérimentation, concertation en équipe académique et concertation nationale, la recherche d'une véritable scientificité,

maîtrisable dans un groupe important, ont conduit chaque formateur-chercheur à se former et à se co-former au contact des autres. La constitution d'un tel groupe stable, formé de volontaires, pendant les cinq années des travaux (préparation de la recherche, 1987-88; création des produits et processus, expérimentations et évaluations en situation de formation aux didactiques par la recherche, 1988-91; évaluation-validation de la recherche, 1988-92), explique que fut atteinte la **"masse critique"**, favorisant une situation opérationnelle et les progrès individuels considérables de chacun des participants (le responsable du réseau compris) : acquisition de compétences larges tant aux plans méthodologique, disciplinaire et interdisciplinaire qu'au plan personnel (processus, attitudes...). Tous ceux qui ont participé à ces recherches proclament qu'"ils ne pourront plus jamais travailler comme avant" et "qu'ils ont besoin de s'intégrer à une formation permanente".

Les I.U.F.M. ont pour vocation de conduire des recherches en formation des enseignants et en particulier en formation aux didactiques. Les I.R.E.M., les I.R.E.G.H. (Institut de Recherche sur l'Enseignement de la Géographie et de l'Histoire)..., structures académiques liées aux universités, ont de comparables préoccupations ; l'Unité de Recherche en Formation des Maîtres aux Didactiques de l'I.N.R.P., héritière de la M.F.P.R., y est déjà spécialisée. Il est donc souhaitable que tous ces efforts de recherche se conjuguent pour créer des **réseaux de formateurs-chercheurs en didactique des disciplines**, des réseaux solides atteignant, par la compétence de leurs membres, cette masse critique en deçà de laquelle des recherches de grande ampleur, destinées à maîtriser des situations mouvantes et complexes, ne paraissent pas devoir être couronnées de succès.

POSTGRADUATE STUDENT UNDERSTANDING AND AWARENESS OF THE SPECIFICS AND PROFESSIONAL DIMENSIONS OF THE NEW NATIONAL CURRICULUM IN ENGLAND AND WALES

David Hall

Abstract

This paper examines the background of curriculum practice upon which the introduction of the National Curriculum imposed a massive restructuring of geography teaching across the twelve years of compulsory education in England and Wales. It considers the results of an end of year assessment of the knowledge and understanding of post-graduate Geography students in teacher training at five Universities, both of subject-specifics and of general principles of curriculum process, and of their attitudes to change. The conclusion evaluates the findings in the context of continuing political change, and raises an agenda for future policy discussion.

1. Background to Curriculum Change

The 1988 Education Act introduced for the first time a National Curriculum across the whole span of compulsory education in England and Wales, creating an unprecedented upheaval in both Primary (5-11) and Secondary (11-16) Schools. Until that date, the educational system was a national system, locally administered. It granted the Headmaster and Staff virtual autonomy over the content and conduct of the curriculum in their schools.

Assessment was also an internal matter. The growth of Secondary Comprehensive Schools in the wake of DES Circular 10/1965 had freed most Primary Schools of the necessity to consider the "eleven plus" examination in their teaching programmes, so that in the 1970's and 1980's there was no formal assessment of pupils until they sat the GCSE examination at 16 where their achievements were graded by publically accredited Examination Boards. Nor had the education system ever used internal assessment to require a pupil to repeat a year on some objective measure of underachievement. Promotion from year to year had always been (and still remains) a natural right, not something to be earned.

Many teachers and educationists believed this loose, "*bottom up*" rather than "*top down*" structure of the curriculum was its strength. It allowed the professionalism of the teacher within the classroom, and the staff collectively within the collegiality of a particular school, to attain the highest levels of performance. It possessed the flexibility for a considered and sensitive response to the immediate needs and circumstance of the individual child at the point of contact. It allowed curriculum planning and policy to evolve in the light of the expectations and priorities of both parents and cultural groups within the local community. It balanced the more

generally formulated educational aims established by the school against local conditions.

This argument had particular force in the Primary School sector. The Plowden Report (HMSO 1967) described several portraits of excellence in creative, substantial, and skilful work achieved by schools using the highly flexible, permissive, and autonomous structure of the "*integrated day*". It raised achievement far above the levels and beyond the limits of any system pegged down to specified content and policed by nationally promoted standardised tests. It was a curriculum concerned with the quality of the inputs and the dynamics of a negotiated process, rather than the formal reporting of outputs: a concern with the fragrance of the flowers in the garden rather than the weight of the fruits in the shed.

In Secondary School, the consequences of a devolved system were more complicated and more discrete. Secondary schools were staffed by specialists who had chosen to teach after studying for three years for a BA degree at University, and taken a one year "end on" postgraduate certificate in education (PGCE). Their colleagues in Primary Schools were preponderantly women who had chosen to teach at 18 and been trained as generalists through four year College-based courses leading to an education degree (B.Ed.) For Secondary School teachers, teaching a subject was a major concern, however sensitive one might be to some more diffuse concept of an "education for life". In addition, any pressure to move towards an "integrated day" had to meet the brutal realism of the GCSE at sixteen with its subject-based specification.

Nevertheless, for a quarter of a century, Secondary Schools have had to face the curricular implications of the best practice of their Primary feeder schools, and the severe criticism of the cramping and restrictive effects of a secondary curriculum based upon a collection of named subjects. In particular, at Secondary level, to many commentators autonomy seemed merely to legitimate inertia, with a curriculum specification of subjects whose presence had been largely determined at the turn of the century by the 1904 Regulations issued by Robert Morant as Permanent Secretary to the Board of Education. Only Latin failed to survive the effects of two world wars, the decline of Empire, the changing technologies and relations with Europe, immigration from the Commonwealth, raising of school leaving age to sixteen, and the creation Secondary Comprehensive education! English, History, Geography, Maths, Physics, Chemistry and Biology remained, with Modern Languages attempting to develop a strong presence despite pupil disinclination. Music, Art and PE were more marginal in status. Other subjects with strong claims, such as Economics, Anthropology, Astronomy, Technology and even Politics, Sociology and Computer Studies were only admitted, if at all, as options in the last two years of study. Proposals for "new" courses, such as Peace Studies, World Studies, Ecology were marginalised either by those subjects who considered such growth as predatory, or by politicians who considered them dangerous.

In addition to outside competition, even if it could be largely ignored, the established subjects were also vulnerable to criticism from within. The reluctance of a subject to respond to changes in society, or to meet the perceived needs of children, were constant complaints. Numerous explanations could be given: the connection of content with Universities produced forms of knowledge which were at best abstractions and paradigms from the real world which the average citizen experienced and inhabited; subject teachers were transmitters of this academic world filled with "shelf knowledge" rather than "action knowledge"; skills were neglected

and even experimental subjects disembowelled by the mimicry of the school laboratory; the GCSE reinforced conventional norms with examination syllabuses deconstructing reality into mechanical components in their quest for reliability and validity.

Such perceived shortcomings of the subject-based Secondary curriculum contributed to the willingness of some staff and schools to consider a rationale which might be based upon the contemporary culture in a wider sense where the descriptors would be broader than named subjects and the timetable "blocked" into larger time slots than the 35 x 40 minutes periods per week which the conventional timetable required. This would help link Primary and Secondary practice, assist pupils in the transition between the two phases, and allow a more integrated approach to learning. Pupils in reception classes from their feeder Primary Schools would not be confounded by a totally alien curriculum system, but encouraged to build upon their range of study skills, in an open and enquiry-focussed atmosphere similar to their previous experiences under an integrated day regime. New structures called "Faculties" were established such as Science, Arts, Language, and Humanities with powers to plan and coordinate the subjects placed within them.

Early attempts to follow through the implications of planning a curriculum on even more general grounds, sourced by the work particularly of American workers from Ralph Tyler (1950) to Hilda Taba (1962) which might study life "in all its manifestations" (Whitehead, 1933) rather than dispense subject knowledge, proved abortive. For example Charity James and the Goldsmiths' Curriculum Laboratory developed the *Fourfold Curriculum* (James 1968) but even seeds planted in Hampshire, the Isle of Wight and the Channel Islands did not regenerate. However the idea of an *over-arching* curriculum policy, planned in accordance with explicit aims and objectives, and with criteria on which the incusion/exclusion of contents might be debated, persisted thought the Seventies. Other ways than by subjects of partitioning knowledge, for example into *"forms"* and *"fields"* (Hirst 1965) or *"realms of meaning"* (Phenix 1964) proved too adventurous, or merely in practice rotated back into subject domains. But more persistent attempts were made to operationalise the work of Her Majesty's Inspectorate in the "Red Book" exercise (DES 1983) and apply their *"Areas of Experience"* to the specifics of school curriculum planning.

Figure 1 shows how the eight (later nine) Areas of Experience might be listed, and each Faculty (and where appropriate, subject in each Faculty) asked to indicate by some weighting principle (ie. 0 = nil, 5 = substantial) their contribution to that area. A curriculum planning group could then use the data to discover those areas which were neglected or overworked, and certain Staff asked to reconsider their schemes of work in order that breadth and balance be sustained. Similarly, in planning their curriculum, subjects should not merely write down an itinerary of content, but construct a series of lessons within a scheme of work which considered the key *"elements of learning"* : (*concepts, skills, knoweldge, values and attitudes*) so that intra-subject balance was achieved. Figure 2 illustrates the principle in its fullest form : it includes in a comprehensive scheme of work, for a given module of content for, say 30 hours of contact time, the aims, objectives; the elements of learning, the sequencing including supported self study, and the requirements for the assessment of work completed and understood.

Figure 1 Using the Areas of Experience to prepare a balance across a Curriculum taught by subjects

Subjects

"Areas of Experience"	Eng.	Maths	Geog.	Hist.	Art	Music	Biol.	Chem.
Indicate on a scale Aesthetic/Creative								
Human/Social								
Linguistic/Literary								
Mathematical								
Moral								
Motor/Physical								
Scientific								
Spiritual								
Technological								

(9)

Indicate on a scale 0.5 the contribution the scheme of work
of your syllabus makes to each of the curriculum

"Areas of Experience"

0 = no contribution   3 = supportive contribution

1 = occasional contribution 4 = significant contribution

2 = marginal contribution   5 = most important

2. Geography in Schools

That Geography was included in the Morant Regulations (1904) can be attributed to the "common sense" view of the time that a knowledge of place was important to the children of a nation where the sun never set. For half a century much of the geography was that of people in places busy at work whose lifestyles were linked with the commerce of an Empire : cocoa, rubber, tea, timber. Other themes included world climates and natural regions, planetary geography, and a look at systematic elements of land, sea and air, linked to map and Etlas work. Primary schools were arbitrary in their focus, and some neglected the subject entirely. One argument in favour of the National Curriculum was the neglect of systematic work, in Geography as in Science, through the adoption of topic work within the Integrated day with its emphasis on events, curiosities, drama and self discovery. (DES 1992)

Secondary geography had to assume a 'tabula rasa' and start work with a clean slate, even though this might mean repetition of focus or of content for some of their

300

Figure 2   Blueprint for a
         Scheme of Work

| SCHEME OF WORK | | | Stage/Year | POS references | |
| TOPIC/AREA/THEME | | | Time allocation | National Curriculum | |

Specific Learning Objectives				Aims (subject specific/ cross curricular)	
Unit Content (Key questions)	Skills	Concepts	Knowledge	Attitudes Values	Teaching/ learning strategies

| Progression Comment | | Enrichment/
Special Needs | |
| +1,2 Cross Curricular Links
+1,2 Cross Subject Links
Special Resourcing
needs of Unit | | Assessment
Arrangements | |

DBH/1990

pupils. The first year at secondary school, in the days of the selective system, was part of a five year plan based upon regional geography, starting with Britain at Home and Overseas, and ending with a study of North America and Britain in regional detail at the 15/16 stage. Systematic geography (mathematical, physical etc.) occurred at intervals along the route. By the eighties, Comprehensive Schools preferred a 3 + 2 structure, with the last 2 years being a self-contained course leading to GCSE qualifications. Courses for the first three years varied considerably : one popular scheme was to combine local studies with mapwork, weather and some ideas in tertiary industry in the first year, followed by a study of Europe in the second year, and Global Issues in the third. But other schools, especially where the tradition was less academic and the intake very broad, including children from diverse ethnic backgrounds, the emphasis upon subject had less appeal than the powerful arguments in favour of Humanities themes where the focus might be upon conflicts in history, or studies in comparative religion rather than groundwork in geography. Half a term's work on the Crusades might only require the drawing of a map of the Eastern Mediterranean and measuring the distance from Jerusalem to Damascus.

None of these courses could exploit the intellectual subject capital of the alert young Geographer trained in the post Maddingley era (see Hall 1991) of models, concepts, systems and statistics. There was no opportunity to develop a geography linked with science and ecology, with mathematics and technology. Only if a school chose to adopt GCSE examination syllabuses developed from the Bristol 14-18 Project (Hickman et al. 1974) or from the Avery Hill Project (Beddis 1974) in the last two years of schooling (14-16) was there any shift in this direction.

A predictable impression from this brief sketch of the background preceding the introduction of the National Curriculum is one of a confusion of provision, a series of checks and balances, of an uncertainty of direction creating a diversity capable of creating both excellence and anarchy. Just as English educationists were impatient with the lofty theorising about the curriculum of their American and Canadian colleagues at the 3rd International Convention in 1967 (Maclure 1968), so in their turn were the OECD commissioners puzzled in their review of the English system a few years later (OECD/HMSO 1975). Generously, the commissioners attributed our distaste for coherent planning to the English heritage embedded in the empirical philosophy of Hume and Locke rather than the continental Cartesian rationalism bequeathed by Descartes, Kant and Compte ...... Even today, in England there is strong resistance to the *bureaucracy* in Europe which requires three locations for the European Parliament! There is a reluctance to enter the voting constraints of the extended European Community and to develop a dirigiste approach to economic planning. The merits of a self-regulating market system are promoted and, in exasperation with the chaotic state of existing institutions and practices change is set in motion, with little regard, research, or reflection upon the consequences of change. Such were the circumstances in which Kenneth Baker, as Secretary of State for Education made the hasty decision to introduce by law a National Curriculum (Lawton 1993).

3. The Structure of the National Curriculum

The 1988 Education Act introduced a new vocabulary. Compulsory Education was still to be provided in separate Primary and Secondary Schools, but was divided into four "*Key Stages*" and the years redescribed in ascending numerical order from 1 to

11. (Figure 3). The old highly regarded "Sixth Form" covering the two years beyond the compulsory period, remained as part of the schools but outside the nomenclature of Key Stages and year Groups. In "new speak" the Secondary Schools covers Years 7-11, with a 'A' level years more properly called "Years 12 and 13" although this is not linguistically attractive.

The curriculum was defined in terms of ten *foundation subjects*, of which only Technology was edded to those named by Morant in 1904. Thus it was received with dismay by those who were working towards more general conceptualisation's such a O'Hear and White (1991), and by other subjects seeking representation such as Health Education or Economics. Information Technology was included under Technology although its "delivery" might be on a cross-curricular basis through othev foundation subjects. Geography retained its presence due to (i) a vigorous campaign by the Association to sustain its status by reference to specific knowledge and skills which were the particular property of the subject and yet part of a common curriculum (ii) the continuing "vulgar" view of the subject based upon traditional views of its teaching about other places, including the Commonwealth and Europe, and (iii) its use of computers in areas of modelling, information systems and in drill and practice routines which the Secretary of State had noted during his express visits to schools.

All foundation subjects were to be taught at each Key Stage, except for Modern Languages which was to begin from Key Stage 3. The intention was to "strengthen" the teaching in Primary Schools by moving away from themes and topic work unless they were supporting progression in the foundation subjects, even if this meant considerable retreat from the integrated day. Within each subject, *Programmes of Study* were to specify "the matters, skills and processes" to be taught at each Key Stage. Therefore, each classroom teacher in Primary Schools had to cover nine programmes of study either at Key Stage I or at Key Stage 2. In Secondary Schools subject teachers had to cover the Programme of Study for Key Stage 3 and the Programme for Key Stage 4.

To focus sharply upon the objectives which the Procrammes of Study might be expected to achieve, each subject was divided into a number of Attainment Targets which together represented the "knowledge, skills and understandings that pupils (of differing abilities and maturities) might be expected to develop in a subject area". In Geography seven targets were defined in the Statutory Order (DES 1991), but later three covering aspects of Knowledge and Understanding of Place at differing levels of scale were collapsed into one, with the other four covering (i- Skills, (ii) Physical (iii) Human and (iv) Environmental Geography. (Figure 4). Eleanor Rawling (1992) has described the difficulty of the Working Party for Geography in reaching this structure, the hard negotiation required to add Environmental Geography as a more forward-looking and issue based approach to the subject rather than the conventional approach adopted by Human Geography, and of the difficulty of including an Enquiry Approach in the text of the Geography Orders.

A number of statements were drafted for each attainment target to specify performances which a pupil might be expected to achieve as mastery of the subject developed. Each statement was then posted to one of the *ten levels* on a progressive incline of difficulty. Figure 5 shows that the levels ran across the full age range 5-16 so that a pupil at the end of Key Stage I might still remain at Level I but could have successfully mastered some statements considered to be a Level 3. At the end of Key Stage 4, the spread of achievement could range from Level 4 to Level 9/10 with Level 6 being the mode.

Figure 3

<div align="center">Key Stages</div>

Key Stage (KS)	Age of the majority of pupils at the end of the school year	New description of year groups
*	5	Reception (R)
KS1	6	Year 1 (Y1)
	7	Year 2 (Y2)
KS2	8	Year 3 (Y3)
	9	Year 4 (Y4)
	10	Year 5 (Y5)
	11	Year 6 (Y6)
KS3	12	Year 7 (Y7)
	13	Year 8 (Y8)
	14	Year 9 (Y9)
KS4	15	Year 10 (Y10)
	16	Year 11 (Y11)
**	17	Year 12 (Y12)
	18	Year 13 (Y13)

*Key Stage 1 (KS1) starts at the beginning of the term after a pupil's fifth birthday. It also include those pupils in reception classes (R) who have reached compulsory school age. The description does not cover nursery provision.

** Years 13 and 13 are sometimes referred to as 'Key Stage 5' although this has no statutory basis; neither does the description of the year groups which has now been widely adopted by schools.

<div align="right">(Source: NCC 1992(b))</div>

Figure 4

GEOGRAPHY

ATTAINMENT TARGETS

	AT's		Strands
Skills	AT1	Geographical skills	The use of maps and fieldwork techniques.
Places	AT2	Knowledge and understanding of places	The distinctive features, similarities and differences between places in local, regional, national and international contexts; the relationships between themes and issues in particular locations.
Themes	AT3	Physical geography	Weather and climate; landforms such as rivers, river basins, seas and oceans; vegetation; animals and soils.
	AT4	Human geography	Population, settlements, communications and movements;economic activities.
	AT5	Environmental geography	The use and misuse of natural resources; the quality and vulnerability of different environments; the possibilities for protecting and managing environments.

Physical, human and environmental geography are referred to in the Order as Themes.

STRANDS

Within each AT, SoA can be grouped into strands of linked content as shown above.

(Source: NCC 1992b

Note: Simplification required by Dearing (SCAA 1994) will reduce these headings in 1994

Figure 5

The TGAT model

Age (years)
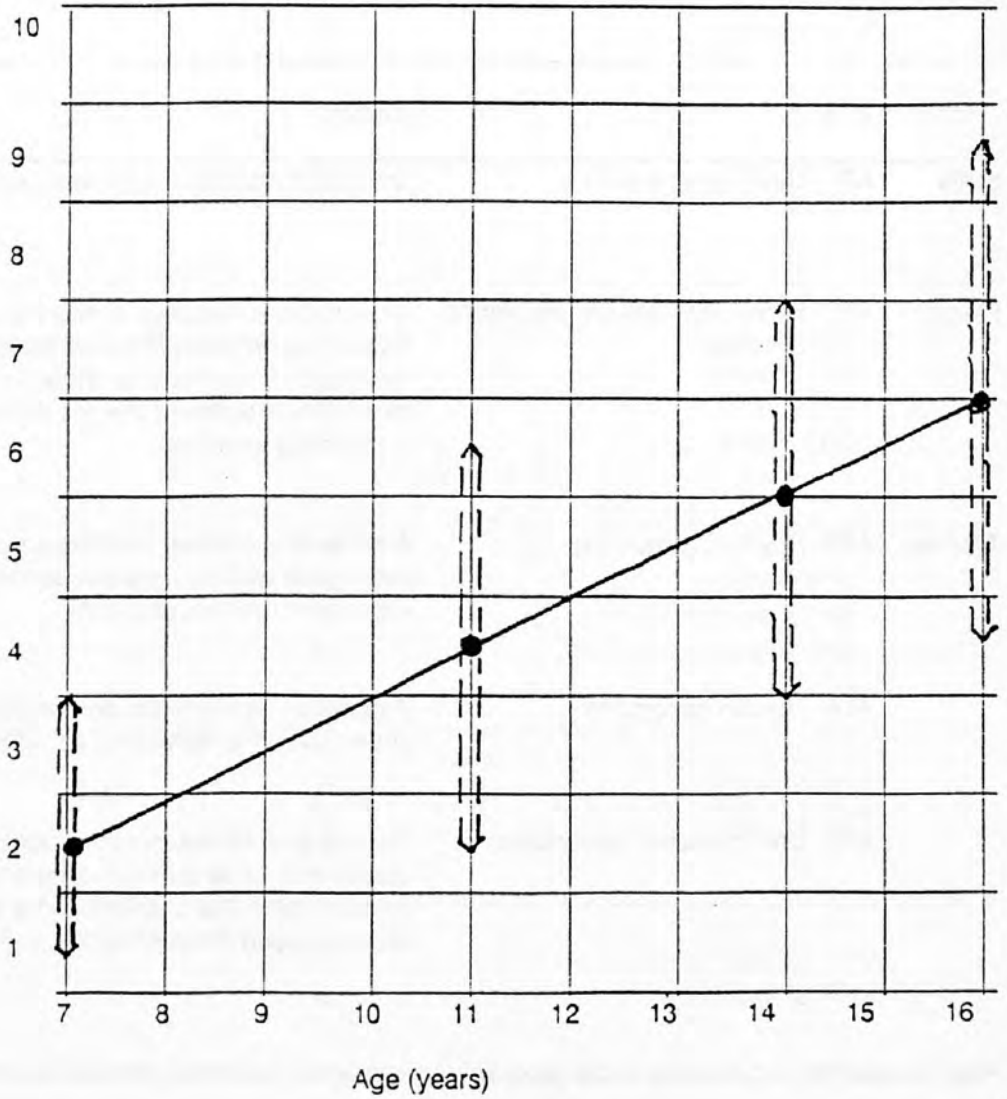
1.   The bold line shows the average levels expected of pupils at the ages specified.

2.   The dotted lines represent the possible range within which the great majority of pupils might demonstrate attainment.

(Source. DES 1988)

In Geography, 180 "statements of attainment" were identified and included in the subject Document (DES 1991) each linked to one of the five attainment targets and each allocated to a level between 1 and 10. Predictably, it was simpler to identify statements linked to attainment Target 1 (Skills) rather than to discriminate between one level and another in attainment Target 2 (Knowledge and Understanding of place). Is it less difficult to know the "near" rather than the "far"? Is there "progression" in the knowledge of facts, and are we thinking of an incline with Level 10 representing the model of a walking Atlas? How can encyclopaedism in Geography be equated with a grasp of molecular Biology or with magnetic fields in Physics? Is it possible to reduce an "understanding of place" to performance statements? In avoiding this obvious problem of defending a set of statements of attainment equating the acquisition of actual knowledge with cognitive growth, the insertion of "understanding" admits a second condition or criterion of performance. But we all know "understanding" is a very slippery term: in the sense of AT2 it may require an appeal to the general in the description of the particular which may mean we have to distinguish acceptable interpretations from heretical ones. Do we *understand* the location of Chicago on the basis of two discontinuous isotrophic surfaces of Lake and Land, or in terms of sequent occupance on the settlers' frontier, or in relation to its function as a node in a market economy? Do we require "no explanation but a knowledge that Chicago is in the U.S.A. and not Canada for (Level 3); that it is on the shores of Lake Michigan (Level 4); or longitude 90 degrees W latitude 42 degrees N (Level 5); one "acceptable" explanation at (Level 6); two at (Level 8); and reference to Christaller and spatial theorists for (Level 10)? And is Christaller still within the subject citadel of post-modernist geography?

Finally, the National Curriculum was to test attainment in all subjects by the use of *Standard Assessment Tests* (SAT's) and *Teacher Assessment Tasks* (TAT's) at the end of each Key Stage. The whole curriculum was introduced on a Rolling Basis, with Geography trailing some subjects by a year, but starting ahead of others. It commenced with Years 1, 3 and 7 in 1991/92 and is to be completed by 1995/96.

4. Teacher Training and the National Curriculum

Subject Lecturers responsible for teacher training have had to review and revise their post graduate certificate programme following publication of the final order for Geography (DES 1991). In the Summer of 1993 research was undertaken to discover the extent of which geography students just completing their one year PGCE course in University Schools of Education had obtained a knowledge of the 1988 Act, and acquired the conceptual skills to handle professionally the rapidly changes circumstances under which they were to teach compared with their experiences as pupils in schools only a few years earlier.

Late in the third session of the 1992/93 year six method tutors in five Universities administered a test paper (Appendix A) to their Geography students, returning unmarked photostats of the scripts to Bristol. Section A of the test paper dealt specifically with the terminology and functional content of the National Curriculum, and required knowledge of facts, key components and definitions of the Orders. Section B was designed to discover the understanding of the more general principles, concepts and ambiguities of the contemporary curriculum discourse as it relates to the practicalities of planning professionally the subject curriculum in the Secondary School.

For students, the purpose of the test was diagnostic. A mark scheme (Appendix B) with commentary was prepared so that students could exchange papers and mark in pairs, and further group discussion take place in post-test seminars. One tutor commented

> *"they really enjoyed the de-brief afterwards, during which several of them - and their tutor - found themselves on a steep learning curve".*

For tutors, the test was formative, intending to assist the reworking of their method and general courses in succeeding years. Caution was need to make summative judgements between differing UDE courses, for students gained some knowledge from experiential learning about the curriculum during teaching practice time in school to complement any formal instruction offered within the more formally conducted programmes within the University. Significantly, they attended school departments in the year 1992/93 at a time of upheaval when geography teachers were coping with the second year of a rolling programme which would be completed only by 1995, and were still attempting to interpret the orders without significant in-service support.

4(i) Section A - the Specifics of the Geography Curriculum

The strengths and weakness in the responses to Section A were fairly consistent between the six courses. Almost without exception students were familiar with the new vocabulary of Key Stages, Attainment Targets and Foundation Subjects, although Art, Music and Foreign Languages (but not Technology) were most frequently overlooked. There was a common understanding that Maths, English and Science were "core" subjects, and Geography was not, but the "rule" used in the curriculum "new speak" of the National Curriculum was not known. As noted in the mark scheme "core" has meant many things during thirty years of use, and has been set against its contrary term in "option", or twinned with the idea of "common curriculum, modular curriculum, core curriculum". Similarly it may seem pedantic to emphasise that Attainment Target 2 should be correctly worded "knowledge and understanding of places", but it was suggested in Part I that this target, if it is to be progressive as to levels of assessment, cannot be left as "knowledge" alone, unless "knowledge" itself is defined further.

Centres varied considerably in their familiarity with "*strands*" (Q7) and two centres reporting complete ignorance about this term, which was deployed by the majority of foundation subjects and not just by Geography alone (for a good summary by subjects see NCC 1992b). We need to ask ourselves if Strands are important as Advance Organisers in the professional preparation of teachers. I suggest we should know how our subject has been partitioned although it would be preferable to have an alternative system of classification to prevent us being slaves to other people's view of the subject, without any contrast in fact or in imagination. Even those centres who had relatively respectable responses were, (apart from one with strong Geography 16/19 involvement!) weak in elaborating the Strands of AT5 (Environmental Geography) (see Appendix B). For the writer, this is an important message for formative purposes.

Questions 8 and 10 were, predictably, those reporting the greatest confusion: with 22% of the students failing to obtain any positive credit for Question 8, and 30% for Question 10. The idea that Programmes of Study express the Statutory content of the subject to be taught in order to meet the aims of the Attainment Targets, at each particular Key Stage was only achieved by 25% of the students: for example

"the elements which must be taught to pupils during a key stage to meet the objectives set in the Attainment Targets"

is a student expressing the point far more pointedly than that of the 1988 Act itself (see Mark Scheme). Many saw the Programmes of Study as a "series of lessons" or "a listing of SOA's", or quite erroneously as a non-statutory aid to the teacher.

There are reasons for this confusion, in addition to the sophisticated reasoning behind the separation of "Programmes" from "Targets" in the 1988 Act. The Programmes ought to have been the point of departure for the subject working group, thus "putting the curriculum first" rather than having it "assessment led": a cry with a long history (see Schools Council 1975). Unfortunately by working from Attainment Targets, through Statements of Attainment, to Programmes of Study the functions were never rigorously separated, with specific contents being included in Statements, which sterilised the Programmes' duties and caused endless difficulties for teachers attempting to teach contents by year groups, and not diachronously. In order to contain differentiated teaching in particular year groups, content logically has to be located in Programmes of Study where it is Key Stage Related (see Hall 1990, Rawling 1992). For Secondary teachers, the idea that one pupil in the same class might be describing the sources of energy in the U.S.A., U.S.S.R.(!), or Japan at Level 6 (AT 2/6c) whilst another was still attempting to describe evidence that materials are eroded, transported and deposited (AT 3/4b) was taking differentiated learning beyond the wildest fantasy of didactic practice.

The National Curriculum Council commissioned booklets for each subject (NCC. 1991) to give guidance and exemplars to amplify the legally drafted language in the Statutory Orders. But despite illustrations such as the Kielder reservoir at KS4 in Geography, spanning levels 4 - 10, to many teachers it appeared to be yet one more document which increased anxiety and a sense of frustration, rather than a lifeline for survival.

As indicated in the mark sheet (Appendix 2) the use of the word "attainment" in three senses led to confused responses in Q10, which were consistently ill informed although about half had some idea that a ten point scale was involved, and that statements were fairly detailed fragments of geography. How the three aspects of attainment held together, and the tensions created between (i) assessment, (ii) key stages, (iii) levels and teaching for progression and through differentiation, were not addressed. The more general reservations about the principles of assessment are considered Section B (Q21) below, but at the technical level many teachers in schools have been struggling to build up revised syllabuses from an armful of statements of attainments using a complicated matrix to check their teaching programme for congruence and for progression. Of course the planners never expected this to happen, although left out to cope virtually by themselves, teachers can hardly be reprimanded. Thus three years "in" from the start, following unanimous action in 1993 by all Unions to boycott the SAT assessment programme the Dearing Report (SCCA, 1994) has accepted that Attainment Targets and the Statements of Attainments, in combination with the ten-level scale, have created an

"over-elaborate system which distorts the nature of different subjects and which serves to fragment teaching and learning in that teachers are planning work from the Statements of Attainment, which has at times reduced the assessment process to a meaningless ticking of myriad boxes" (para 7.25 p61 SCAA 1994).

Sir Ron Dearing's Report has also brought amendments to the whole enterprise. A stroke of the pen has adjusted the meaning of "core" (Q5) with SAT's to be set for English and Maths at seven year olds, and Science from eleven. Geography or History (but not both) may be dropped at the end of Key Stage 3 and Art and Music may be dropped unconditionally at the same time. In this sense, the concept of a *balanced* curriculum from 5-16 has been abandoned.

Many of us have argued that the whole National Curriculum exercise has been overloaded by addressing itself to subject generated priorities, and now in consequence slimming down is an exercise in lop-sided pruning. Levels 1-10 are to be compressed to cover Key Stages 1-3 only, with the GCSE grading to assess Key Stage 4 at 16. By the time of this Conference, I predict also that working groups will have reduced Geography to one Attainment Target - perhaps "Investigating the Environment". Or one drawn from Commissions International Charter (IGU, 1992) itself?. But that would be too much to hope for, although Catlin's address to the Geographical Association (Catlin, 1993) gives us some straw of optimism for the future, should the distribution of power shift away from central control. Even the 180 statements of attainment may be abandoned and replaced with ten simple level discriptors for each of the ten levels.

4(ii) Section B The Professional Dimensions

Discussion has moved away from the technicalities and vocabulary of the National Curriculum to more general considerations, to the professional dimensions examined by the questions within Section B. Question 12 for example, on Enquiry Learning, is open-ended. The markers were encouraged to make judgements about scoring within the general criterion bands which preceded the mark scheme (see Appendix 2b) (Remarking indicated that students had marked this section professionally and consistently).

The links of Enquiry Learning with an Integrated curriculum structure are well established, and within Geography it has been an ever growing ideology since the Avery Hill and Bristol 14-18 Projects, discussed earlier in Section I, developed inquiry routes for Schemes of Work. In the Eighties both Geography 16-19 Project with its "Routes fov Enquiry (Naish 1987) and the Geography Schools and Industry Project (Corney 1992) refined these approaches (for an up to date resume see Walford 1991), and enquiry was also written into the National Curriculum as the key learning approach (see Rawling 1992, and in Walford 1991). Many PGCE tutors consider it fundamental to their professional objectives that students understand and use enquiry in teaching/learning. Responses to Q12 were encouraging with 40% offering three substantial points of definition. Even so, it is difficult sometimes to decide whether a definition is the tip of a cognitive iceberg, or merely driftwood casually floating in an ocean of ignorance:

"one in which pupils are developing skills through a proactive process".

But very full definitions were offered:

"pupils are encouraged to ask questions concerning an issue or concept, ie, what, where, how, or why. They decide on their route of enquiry, collect evidence from primary and secondary sources, eg. fieldwork, books. Based on evidence, process is explained and analysed, conclusions are then drawn, and where possible predictions made. Pupils are encouraged to review their own personal responses, values and attitudes."

Responses to later questions on such broad conceptualisations were less consistent. The terminology of Question 13 - concepts, skills, knowledge, understanding and content - have a crucial function in lesson planning (as in Figure 2). But, activity work in PGCE training sessions, structured to emphasise the importance of enquiry work be it in a school classroom or a University method session, does not seem to facilitate successful internalisation of these terms at the *symbolic* level, even if they can be redeployed *enactively*. We are concerned here with language in the Wittgenstein sense of "word games", and an in-depth review of these important issues requires a monograph of its own.

These comments also apply to question 22 asking for *breadth, balance, depth, progression and clutter* to be distinguished at both subject and curriculum level. Although these words have a long pedigree, they were brought together in the Green Paper "Better Schools" (DES 1985b) by Sir Keith Joseph as if their meaning was clear, and used either loosely or perjoratively as contributions to sharpen up thinking, policy and standards. As students show only too clearly, their commonplace usage interferes with any particular application they may have in clarifying curriculum discussion.

Some saw *breadth* as systematic topics - land, air, ocean - or covering all five of the new Attainment Targets. But some saw it as scale (global/local) or as global coverage whether by regions or by broader themes (developed/underdeveloped etc.) Most respondents then saw *balance* as some weighting of their definition of breadth - usually without justification on an equal shares basis. Only 6% thought of balance in terms of elements - skills, attitudes/values,- and 16% thought balance was lack of bias or neutrailty.

To reflect on the meaning of *depth* reminds one of the previous discussion of the term "understanding" at the end of Section 3, and of the linkages with "levels" and "progression". It is commonplace for both rationalists and empiricists see education as a journey of initiation, where sense experience and rational reflection continuously interact, and translate "knowing that" and "knowing why" into higher levels of knowledge *and* understanding. Experience then grants us the power to speak truly what we know, and with the malice of conceptual depth. As I struggle at the moment with translating this dimension of 'A'-Level core to a new syllabus document we can imagine "depth" graphically as a wild-cat well, drilled down through the graph to the horizontal axis of Figure 5. A "sense of place" or "grasp of systematic geography" can be measured in terms of the ability of either to conduct a discourse of increasing ebstraction within a specific spatial context, or to cluster and organise a number of events, spatial and temporal into a system of explanation. It is a technicist view of education based upon elitist principles, where progression is an incline of difficulty towards a citadel; of initiation into rational forms or fields of knowledge. Nevertheless, 80% of students see "depth" in terms of increasing detail, not in terms of anideology linked to increasing conceptualisation, and 'progression' as a strategy linking one topic with the next, with each topic becoming more complex than the last. The appropriate curriculum metaphor is that of a tree where levels have more branches as we progress - all of which presumably have to be recorded, classified, reported and assessed. It is not a spiral where at each turn there is an increase in conceptual understanding, and with the principle or Occam's razor some redundancy of information and the promise of the ultimate vista of the whole from the pinnacle of the Hegelian absolute. In this sense, too, "clutter" can be seen as an inability to thin the trees so better to understand the wood, and not merely as Whitehead said,

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to "see the wood by means of the trees".

Such matters lie beyond the scope of reflection by most PGCE students, although I am confident 50% from this survey have a working sense of these dimensions, even if in their responses one set of words are merely replaced by another: for example

breadth = width;
balance = equal representation (of parts)
depth = amount of detail
progression = development of greater understanding
clutter = disorganised learning.

I should be very interested to share with colleagues their knowledge, experiences and suggestions on the way forward with the problems and issues raised by both of these questions (Q13 & 22).

Similar, if not so fundamental, issues are raised by Q14 (Attitudes and Values), Q15 (Aims/Objectives), where a substantial number (over 80%) are only aware of the terms and do not have a sufficiently informed understanding of them. Again, the test drill may not have gone deep enough in such a broad survey. A response

attitudes   how one reacts to a situation
values   how one rates certain things

gives a strong positive signal, but not one responder gave examples to anchor the difference and the meaning upon some solid ground. Only 10% made their explanation firm by considering reservations as well as the importance of values inclusion and analysis within the curriculum. However, the fact remains that 80% of respondents are in favour of their inclusion within the curriculum, even of 75% don't know what they are!

For those who see teacher training largely as a practical course, and define professionalism as a mastery, of applied intellectual skills, it is a matter for quality control that only one quarter of the postgraduates could separate logically the difference between aims and objectives by assigning them different functions and emphases in lesson and in topic planning. Again the use of the *"areas of experience"* as an alternative way to build a curriculum was quite unknown, although I would have judged it valuable to include a simulation in foundations (cross subject) strands of a course, on the basis of the earlier (section 1 and Figure 1) discussion on a curriculum planning. The question, and Q21 on Assessment, may have been better cast in a data response form. Only two (>2%) students referred to the list, and the more informative recalled eight of the nine areas! Perhaps s/he had read the first edition (DES 1977) endorsed by Shirley Williams, before Sir Keith's personal insistence a decade later that "technology" be added to make nine for "Better Schools"! (DES 1985b). For most, areas of experience are linked to "travel" or field work, computing, or play dough; or some subdivisions of home and school life : they do not wish to be restricted to an epistemological curriculum.

The question on Assessment proved a Pandora's Box : as indicated on the mark scheme (Appendix B) it was assumed that the responses would refer to the kinds of assessment linked with TGAT Report (DES 1988) and with the immediacy of the controversy over SAT's and TAT's, the principles would be recalled, or included as a "major kind". Instead, there was too much *clutter!* A *pot pourri* of coursework assessment, self assessment, moderated, continuous, and final : an endless list perhaps sourced from school and undergraduate experiences. As TGAT claims to be the equivalent solution for assessment as the Swiss Knife is for camping, perhaps it is

understandable that the distinctions are elusive. There were only 28 citations of TGAT categories, usually "formative", of whom nearly half were from one centre only. It seems that tutors are reluctant to reverse the precedence of curriculum and enquiry over that of assessment matters, and these principles remain neglected, and considered only in the context of Schemes of Work.

The last two open ended questions (23, 24) deliberately canvassed students views on contemporary issues, as a small counterweight towards a 'person-centred' evaluation of Geography and its future. The preference for separate subject rather than Humanities context was overwhelming with a 9 to 1 majority. Additionally 7 respondents were equivocal, seeing merits and dangers very much in accordance with this paper's section 1 review, with 6 suggesting a lower school (Key Stage 3) and upper school (Key Stage 4) divide. Here there is a pronounced swing away from Humanities, although what Geography can teach to an acceptable level of breadth, balance and depth with 5% of contact time using enquiry methods is alarming. Larger time blocks with staggered year groups rather than a diminutive presence at all ages; modularity or an attempt to redefine breadth as "environmental geography" and ignore a classical typology of balance?

The view of the National Curriculum was severely critical, with general approval limited to 15% of those who responded (10% ignored the question). For every positive view, three were strongly hostile, and with one seeing both advantages and problems from its imposition. The majority of the hostile respondents gave very considered reasons for their stance, those in favour were less inclined to substantiate their attitudes.

"No, it is too rigid, demanding too much in too short a space of time, eliminating most of the scope for fieldwork and longer investigation of issues which I feel are integral parts of Geography".

and for an equivocal view:

"only a minimum requirement, and certainly shouldn't become a strait-jacket. The role of geography should also be to develop a sense of independence and critical judgement through the study of controversial issues".

Conclusion

The National Curriculum has proved too detailed, too complex, too prescriptive and too hurried in its implementation. Even were it possible to manage the assessing and recording of pupil progress, the levels attributed to statements have no warranty underwritten by research, just as the varied interpretation of their meaning by individuals shifts the level to which that statement is intuitively related. It is not surprising that the Dearing Report pays long attention to the objectives of the ten level scale, the difficulties in practice of delivering a criterion referenced approach, and the view that levels are a misguided attempt to define unambiguous criteria for the complex process of teaching and learning. One alternative would be to abandon the scale and replace it with gradings at the end of each key stage. But to adopt this policy would run counter to the current viewpoint of the present Government : the whole point of the existing system is to provide information on school performance in both "absolute" and "value added" terms. As I have said elsewhere the current perspective is that based upon an "entrepreneurial" viewpoint of the culture, not an "ecological" one (Hall 1990). If we can certify facts and understanding at different levels we can attribute the value of every learning activity to a data base.

But the value of the National Curriculum is that is has drawn urgent attention to a number of critical issues which have only been too easily avoided in that void between general theoretical principles and the teaching of curricula in a systematic intentional and critically effective manner. Even this paper indicates the patchy nature of the ability of entrants into teaching both to possess the "matters, processes and skills" at each side of the divide, and make an evaluative commentary about their interaction. It is one instance of the basis of the argument to take the curriculum out of the hands of the teacher and to reduce his/her function to that of the technician. The excellence of the top 15% of the profession is insufficient as a "pay off" for the other 85% whose teaching quality ranges from indifferent to abysmal, and one in three lessons is deemed unsatisfactory.

In teacher training we need to redouble efforts to be clearer and sharper in our terminology. We need to set the content of the Statutory Order against the general issues of curriculum planning and assessment structures (ie Sections A + B of the question paper), and evaluate this interface by reference to concrete matters and processes in Geography. For example I discussed the need that AT2 puts upon us to consider "progression" and "levels of difficulty". It raises matters of comparability with AT3, or AT4 in the generation of level-related statements. And why do the orders refer to "vicinity" rather than locality of neighbourhood, are the phrases "sense of place" and "knowledge of place" interchangeable? Why are students better able to recall the strands of AT2 (physical) and AT1 (skills) but are weak in doing this for AT5 (environmental)? Surely AT5 should be the core objective of our teaching in schools? What by implication is marginal in the ruthless drive to simplification? Indeed, what will be a geography of "virtual reality"?

The death of Richard Hartshore (Paterson 1993) reminds me of the vivid debate on his "Nature of Geography" and a paper I wrote as an undergraduate supporting Schaeffer's criticism of his position. In our efforts to sustain Geography as a statutory subject by recourse to "exceptionalism" we have lost the vital, supportive contribution the subject has to make to the general education of our children, not in subjects aggregated as bricks in a curriculum wall, but as part of the brick clay itself which is infused systemically across the total cultural structure. A Geography which begins from the complex realities of contemporary life practices and situations linked with the concerns and issues of everyday environmental living. There is less emphasis upon acquisition and competition, be it money, grades or levels, and a recognition that competence is a pressing need but not to the exclusion of care and compassion: of what George Eliot said of Dorothea:

"Her full nature, like that of a river of which Cyrus broke the strength, spent itself in channels which had no great name on the earth. But the effect of her being on those around her was incalculably diffusive: for the growing good of the world is partly dependent upon unhistoric acts; and that things are not so ill with you and me as they might have been, is half owing to the number who have lived faithfully a hidden life, and rest in unvisited tombs".
(George Eliot, Middlemarch, 1871)

UNIVERSITY OF BRISTOL   SCHOOL OF EDUCATION

P.G.C.E. Course

GEOGRAPHY AND THE NATIONAL CURRICULUM

SECTION A The National Curriculum

	KS1	KS2	KS3	KS4
1. Give the age bands for the Key Stages in the N.C.				

	1st Form	3rd Form	5th Form	Upper 6th
2. Give the new equivalents for the old year groups in the Secondary School				

		Year 9	Year 11	Year 13
3. In what year will the National Curriculum for geography be introduced at				

4. Name the Ten Foundation Subjects in the National Curriculum
Underline the 'core' subject

5 What is the difference between a 'core' and a 'non core' subject?

6 Name the Five Attainments Targets (AT's) in Geography

1._____

2._____

3._____

4._____

5._____

7 (a) What "strands" exist in AT1?   (b) in AT3?   (c) in AT5?

8. What is a Programme Study?

9 What are 'Non statutory Guidelines' and what is their purpose?

Do they achieve them?

10 What is the distinction between Statements of Attainment (SOA's) and Levels of Attainment?

	KS1	KS2	KS3	KS4
11. Specify the levels of attainment which pupils might be expected to span at the end of				

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12. Attempt to define Equiry based learning

13. Consider, *in a curriculum context, the following terms*

	What does the term mean ? specifically?	Can you illustrate	How is the term valuable in planning a topic/scheme of work?
concept			
skill			
knowledge			
understanding			
content			

14. What are: Are they part of a planned Curriculum?

   (a) Attitudes

   (b) Values

15. Aims: Objectives: Goals
   Why are these terms used rather than just one to indicate *'intent'*

16. What, specifically are the *'Areas of Experience?'*

17. Then, what are the *'Elements of Learning?'*

18. What is the intended meaning of the phrase *'The Entitlement Curriculum'*?

9. What, at the present time, are the cross curricular elements deemed important and to which geography might contribute?

---

0. Distinguish between:

A lesson plan

and

A scheme of work

---

1. Specify the four major purposes which an assessment maybe designed to serve

---

2. Distinguish between:	within a subject	across the Whole Curriculum
Breadth		
Balance		
Depth		
Progression		
Clutter		

23. Would you argue for a future Geography (KS3, 4) within a humanities context or as a separate subject in the curruculum?

---

24. Does the Geography Curriculum as presently determined by (i) the five AT's (ii) the SOA's and (iii) the ten levels of Attainment express your own sense of what the role of Geography should be in Secondary Education?

MARK SCHEME - GEOGRAPHY AND THE NATIONAL CURRICULUM
SECTION A

Geography and the National Curriculum (Mark Scheme)

Q1	Age bands are "end of the year" technically : ie 6/7; 8-11; 12-14, 15/16 allow four marks if "correct", or four if the idea of 2yr/3yr/3yr/2yr age bands is stated	max <u>4 marks</u> (4)
Q2	Yr 7; 9; 11; 13	<u>4 marks</u> (4)
Q3	1993; 1995 Please add 1 mark if Year 13 left blank! (Years 12 & 13 NOT within the National Curriculum	2 each = 4 + 1 bonus for blank! = <u>5 marks</u> (5)
Q4	1 mark for each *foundation subject*: (a) <u>M</u> <u>Sc.</u> Eng. Tech. MFL. Hi. Geog. Art. Mu. PE (b) 1 mark for each core correctly underlined (ie. M Sc.Eng.) (c) bonus 2 marks if RE <u>not</u> written down here	10 marks + 3 + 2 = <u>15 marks</u> (15)
Q5	*Core subjects* are those for which SATS are compulsory throughout all key stages 1–4 However Tech and MFL are sometimes referred to as the *'extended core'* because (i) they are compulsory at KS3 and KS4 and (ii) are SAT tested [*note* the idea of a *'core curriculum'* is historically older than the national curriculum and has been defined in many different ways). This particular meaning has been captured and put to work for current Government policy.	3 marks if good on core (max) 5 marks (max.) if some reference to extended core <u>Max 5</u> (5)
Q6	*Attainment Targets* Geographical Skills; Knowledge and Understanding of Places; Physical Geography; Human Geography; Environmental Geography note AT2 is often fluffy ie humanised into "People and Place" or shortened to "Places" Deduct a mark for this! The correct statement implies both factual/locational knowledge AND some more general reference to the "why" of location.	2 each AT Max. <u>10 marks</u> (10)

Q7	*Strands*

(a) (i) use of maps

(b) (i) weather & climate
    (ii) fieldwork techniques (AT1)

       (ii) rivers,river basins,seas,oceans
       (iii) landforms

    2 x 1$_{ea}$ = (2 marks)

       (iv) animals, plants, & soils (AT2)

4x 1$_{ea}$ (4 marks)

(c) (i) use and misuse of natural resources
    (ii) quality of vulnerability of differing environments
    (iii) possibilities of protecting & managing environments (AT5)   Total 12 marks
       3 x 2$_{ea}$ = (6 marks)   (12)

Q8	*Programmes of Study* "Matters, skills, and processes (1 mark for each term) which must be taught to each pupil at <u>each key stage</u> (1 mark) in order for them to meet the objectives set out in the AT's". (1 mark)	5marks
	note: no need to parrott, but as long as the key terms, and the idea that POS are set out structurally KEY STAGE by KEY STAGE, and that they are supposed to support an intentionally designed curriculum leading towards performance objectives, seem most important. The points that POS are compulsory and are for every pupil seem rather too obvious for a mark/or credit here.	(5
Q9	Credit the ideas that Non Statutory Guidelines are "non compulsory"; examples; advice to teachers; or those to help unwind jargon of National Curriculum.	2 marks (2

AT's SOA's and level of Attainment.

This is difficult. "Attainment" has three official jobs in the N.C. so it is an area
of confusion; so we have avoided throwing in "Attainment Targets here to add even more
dust. Credit idea that *statements* are precise objectives capable of being
assessed with some precision (although in practice this notion is highly debatable!)
whereas *levels* are supposed to represent a progression of difficulty (be it a
skill or a concept or a combination of both) related to age, and in National Curriculum divided into
ten parts on a continuous scale

2 max
for "target"
+ 2 max
for levels
1 for
good synthesis
illustrative comparison

---

011   KS1   Levels 1-3;   KS2   Levels 2-5;   KS3   Levels 3-7;   KS4   Levels 4-10;

deduct from 5 marks for each error and award no marks if the "lowest" level does not move from
1 to higher levels at KS2, 3 & 4

5 marks max.
(5)

SECTION A
Total Marks 72
Convert to % for indication of subject core knowledge

APPENDIX B

SECTION B

As this section is broader, you will need to apply judgment to your award of marks for most of these questions. For example,
the THREE performance levels specified by MEG D/GCSE Geography allocates up to 1/3 marks for basic understanding, up to
2/3 marks for sound understanding, and over 2/3 for a rounded, accurate, balanced and perceptive response to the question!
Other good schemes are Geog 16/19 guidelines, or the "Report Mark Scheme" p.82, of the 1995 NEAB 'A'-Level syllabus which
rather freely adapted, reads:-

ASSESSMENT OBJECTIVES	Response Level I up to 1/3 marks	Response Level II up to 2/3 marks	Response Level III up to full marks
Knowledge and Understanding	Demonstrates some basic knowledge of question	By accurate terminology, demonstrates a sound sense of the question	Clear mastery full explanation and where open ended, the response is consistent.

012   **Enquiry Learning**

Ideas of *independent* learning, with pupils planning their own learning paths either individually or in groups, possibly
defining the focus of the topic, setting the major parameters, offering tentative conclusions (divergent outcomes),
weighing evidence for recommendations; ideas of teacher as consultant in supportive role, pupils researching own
resources and evidence, following an enquiry route but being responsible for phasing, emphasis and process. *Three*
good ideas for Level III award.

10 marks
(10)

013 **Concepts, Skill, Knowledge, Understanding and Content**

"Concept" "A generalisation which helps classify, organise and understand knowledge and experience" (DES 1985a)

(i) illustrate any examples from AT "strands" - or, ie. "friction of distance, "complementary good", "minimum population
requirement", "burden of dependency" "sequent occupance" + all the gamut of physical/mathematical geography and for
AT5? say "contingent valuation","hedonic pricing policy" etc.?

(ii) its value : helps control the selection of content by an organised and logical set of generalisations and avoids a
syllabus which is an encylopaedic collection of disconnected facts. See MEG 'D', MEG 'E' GCSE, or WJEC, 16/19 Project
or NEAB 1995 A-Level GCE.

(ii) skill" : *a capacity or competence; the ability to perform a task either manual or intellectual"*
examples should be easy : see AT(1) of the NC!

its value: should refer to its mediation between real objects (facts/details/specifics) and "concepts" which can become
inert. "Skills" can be the flux between them : hence syllabuses use skills to clarify performance objectives (leading to a
vocationalist emphasis of a scheme of work/and/or a "middle band" approach to a syllabus planning). There is a
rationalist/intellectual emphasis embedded in concept driven syllabuses which can become remote from the real world of
the child unless carefully structured in an enquiry based scheme of work. Skills protect the realism of action and practice,
of doing and performing.

(iii) <u>knowledge</u> : An interesting and slippery term (cf AT2 - why is it there as well as "understanding". Is this a "Mastermind" view of education knowing = knowing THAT, knowing HOW, Knowing WHAT.
Can we "know" WHAT OUGHT (i.e. Empirical Enquiry Route, Geog 16/19.).
I expect your mark will be highly subjective here: but Red Book III definition is *the information which is selected to develop skills, attitudes and concepts and achieve the aims identified in the curriculum*" (DES 1983).

(iv) "<u>understanding</u>" see earlier notes on "knowledge", but suggest understanding is the abiltity to see a concept illustrated in phenomena which is under inspection by senses. Hence it is achieved by the progression of experience, of action, and of reflection upon experience.

(v) "<u>content</u>" Best to think of this as an umbrella term across statements of skill, generalisation, fact, information. The sum total of a scheme of work or a syllabus.

2 marks per box 6 per row
6 x 5 = 30 max.
(30)

Q14 **Attitudes** "A disposition to act in a particular way in relation to oneself or to other groups or individuals in society"

Values   A system of beliefs, which often shape our attitudes and hence our behaviour.   (DES 1985a)

Whether they are part of a curriculum.: most educationists would say "YES" although a wide range of views exists about the feasibility of including them in an assessment scheme.

3 x 3 x 3 9 marks
(9)

Q15 **AIM** a general statement of intent
Objective "a more specific target which can be realised in practice and assessed with some precision".
(DES 1983 & 1985a)

The distinction has arisen for practical reasons in the desire to link curriculum with assessment. Yet the sense that education has longer term goals which cannot be reduced to time spent in school nor precisely assessed during one's schooldays sustains the dualism.

3 x 3 = 6 marks
(6)

The Areas of Experience

Q16	Aesthetic/Creative	Mathematical	Scientific
	Human/Social	Moral	Spiritual
	Linguistic/Literacy	Physical	Technological

(DES 1975, 1985b & 1983)

<u>Areas of Experience</u> are based on the idea that knowledge <u>need not necessarily</u> be compartmentalised into SUBJECTS but approached by other routeways. Expect a low score or nil response!

10 marks
(10)

The Elements of Learning

| Q17 | Concepts, | Skills, | Knowledge, | Attitudes and Values; | 2 marks each term plus |

Really "<u>Elements of learning</u>" summarises the FOUR major headings used for planning
syllabuses, schemes of work, or even lessons

2 floating
(10)
(DES 1985

Q18 **The Entitlement Curriculum**
This can be seen with a MANAGEMENT nose, or a HUMANISTIC eye
Do we mean
(i) a <u>pupil</u> entitlement to either the National Curriculum or
(ii) an entitlement to the breadth implied by the elements of learning, or
(iii) the areas of experience, or
(iv) to an open or varied choice of contents rather than policy imposed compulsions of the foundation subjects.?   (10

Q19 Cross Curricular Elements

Somewhat obsurely divided by NCC into "Dimensions", "Skills", and "Themes" (NCC 1990b)
but more usefully for Geography:-

Economic & Industrial Understanding	Information Technology	Bias
Citizenship	Study Skills	
Environmental Education	Numeracy	Gender
Careers	Problem Solving	Equal
Health Education	Communication	Opportunity
	Personal & Social	

Award 10 max for good spread of items here

Note Many people feel our education system should have moved into these areas (especially SKILLS) as the "core curriculum"
and abandoned the stiffling grip of inert subjects - see also Q23 below - an embraced a modern version of vocationalism.

(10)

Q20 Fight this one out for ten marks! Do you build up from lesson plans or start from a scheme of work?
Bonus if some differences appear ie. would one expect to see assessment and aims written into
a scheme of work but not into a lesson plan.
10 marks
(10)

Q21 *Assessment*
Could be a Snake Pit - who answered "GCSE, A-Level, SAT's and TAT's etc? Penalise harshly by awarding ZERO.
We are dealing here with TGAT so check it out:-

FORMATIVE	SUMMATIVE	DIAGNOSTIC	EVALUATIVE

and of what value is a "paper and pencil test" in all this sophisticated jungle of testing procedures ...?
Most IQ's of 140 or lesss can't distinguish between Formative or Evaluative and so award yourself LEVEL 20 (on
Attainment Target Statements) if 100% accurate....

(DES 1988)
10 marks
(10)

Q22   Another "nasty" - are we dealing with Geography per se, or Curriculum in toto?
ie

Breadth =	covering all "Geographies" (Human, Systematic, Physical etc) or does it mean "all Continents and Oceans", or all the elements of learning irrecpective of subject matter.
Balance =	Equal weighting to each AT component (presumably by time or by syllabus?) or are we talking about balance between skills, concepts, knowledge? or talking about balance in dealing with Attitudes and values
Depth =	more information or more low frequency words, or more jabberwocky Geog? or is it to do with KEY CONCEPTS supported on solid foundations of Information? (see Definition of KNOWLEDGE on 13)
Progression =	The latest myth ... tell me
Clutter =	Information overload (ie: not needed to reach understanding - indeed can prevent it). Needless repetition within Geography or between Subjects (ie. Plate Tectonics) = OR what we have thanks to the National Curriculum?

5 x 5 = 25 marks
(25)

Q23   *Humanities or Single Subject?* After that mean Q21, use criteria of NEAB at the heading of Section B
up to Level 3 (full marks) but avoid SUBJECTIVE BIAS in your marking.

10 marks

TOTAL SECTION B = 150 marks

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THE IMAGE OF SCHOOLGEOGRAPHY IN FINLAND

Hannele Rikkinen

"... Teachers may think that they are teaching subjects, but what, of course, they are doing, for better or worse, is something far more important in the long run. They are instilling an attitude to subjects."

Rex Walford started his booklet "Games in Geography" with these words 25 years ago. After all these years, the idea is still true and will also be true in the future. The teacher is certainly not the only factor, but he or she is a very important person, who can open the wonderful world of geography to the pupils or make them hate the whole subject all their live.

The inquiry to the teacher trainees

The first-year university students have just left their schools, so they may be a good population for examining what kind of image the school gives about geography or other subjects. My duty in the teacher education at the university of Helsinki is to give knowledge to the teacher trainees on how to teach geography at the secondary level (subject teachers) as well as the primary level (class teachers). The former group has selected geography for their life-work, in Finland mostly combined with biology, so they must have a positive image of those subjects. The latter group is different. They want to become teachers, but geography or biology may not necessarily play a very important role in their choice of career.

Anyway, I usually start my course with the primary schoolteacher trainees discussing with them what the word "geography" brings to their mind, what they think about teaching geography, and what kind of feelings they might have for or against it. During the last spring term, I decided to make a more in depth inquiry. At the beginning of my first lesson, I requested the students to write their answers to the questions I asked. My purpose was to compare the images the students hold about geography with their images about other natural sciences. At the same time, I wanted to find out whether they know some concepts belonging to the Finnish curriculum jargon.

I asked the following questions one at a time. The time given for answering was only one minute for each question, except for the semantic profiles:
1. What belongs to the natural sciences in your opinion?
2. What does the concept "modern subjects" mean?
3. And what is the meaning of "orienting subjects"?
4. What does the word "science" mean?
5. What kind of associations do you attach to the following words:
   a. Biology
   b. Physics
   c. Chemistry
   d. Geography

6. How many courses on those subjects did you take at your high school?
7. How well did you do at school? Rate it from 0 to 5: 0 = not at all, 5 = excellently.

8. On the next page there are four semantic profiles of the same kind made with 21 pairs of opposite attributes and a 5-point rating scale between them. Name the first profile "Biology", the second "Physics", the third "Chemistry" and the fourth "Geography", Choose your ratings (only one x) on the basis of your experiences at school! (Fig. 1).

9. Estimante how much the content of the subject, the teacher and the text books affected your images about the named school subjects! (1: a little, 2:more or less, 3:strong).

Subject	Content	Teacher	Text books
Biology			
Physics			
Chemistry			
Geography			

The results from the geographical point of view

At first I will consider the results generally and the I will concentrate more closely on the interesting answers from the geographical point of view.

Those 60 first-year primary-school teacher trainees who answered the inquiry belong to a very selected population, because it is extremely difficult to be admitted to that education programme in Finland, especiallly at the University of Helsinki. They must all be versatile, talented persons, so it is not surprising that they did very well at school. The mean in that question was over 4, nobody rated it as 0 and only one chose 1. 34% of the respondents rated it as 5.

But what was surprising was that the respondents had a very narrow view of natural sciences, and the requested curriculum concepts were quite unknown to them. And, what I did not expect, the respondents had difficulties in remembering how many courses they had taken on the subjects. Our high school teaching has been given in the form of courses in Finland for more than ten years now (1 course comprising 38 study-hours). There the pupils can take two compulsory and one optional geography courses. Only 38 of the respondents were able to remember and 28% of them had taken the optional course, too.

The semantic profiles

The semantic profiles (Fig. 1) tell what the teacher trainee thinks of the subjects concerned on the basis of his or her experience at school. There are the positive attributes on the left-hand side, and the negative on the right-hand side of the rating scale. If one compares the profiles: geography and biology on one side, chemistry and physics on the other. And really, it is very pleasant to see that the profile of geography is placed on the most positive side of the scale.
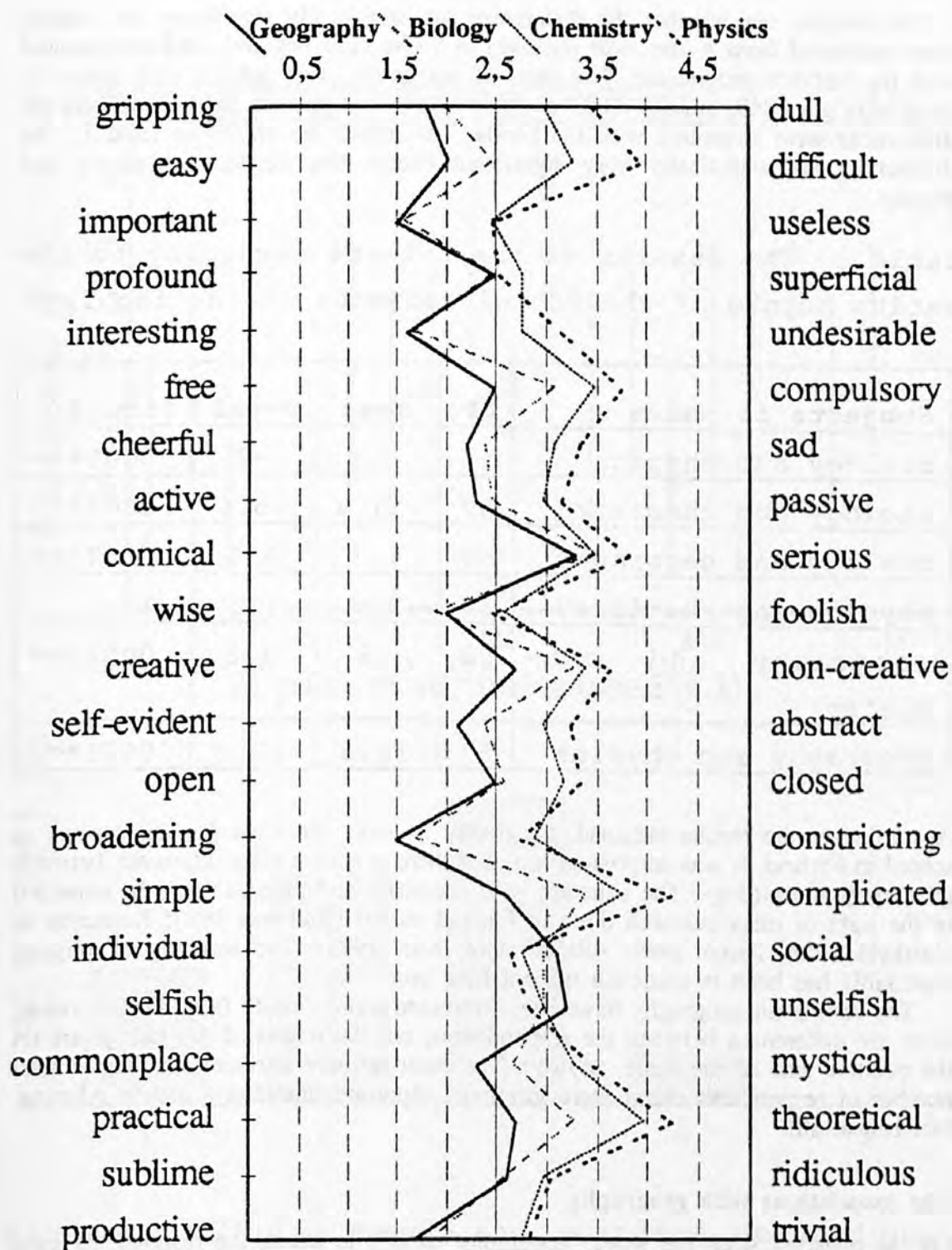
Figure 1. The profiles of the Finnish teacher trainees' opinions about four subjects. Ratings based on experiences at school.

For finding out whether the differences are statistically significant, the ratings were numbered from 1 (the most positive) to 5 (the most negative) and manipulated with the Statview-programme. The sums of ratings for every subject were counted:- geography got 2840, biology 3160, chemistry 3841 and physics 3884 points and the differences were examined with the t-tests. The results are shown in table 1. The differences are statistically very significant except that bewteen chemistry and physics.

Table 1. The results of the t-tests according to the rating points of the school subjects in the inquiry.

Subjects in pairs	DF	Mean	P-val	Signif.
biology and physics	57	-14	-8	.0001***
biology and chemistry	59	-11.4	-6.5	.0001***
biology and geography	58	4.7	3.6	.0007***
physics and chemistry	57	2.9	1.5	.14
geography and che-mistry	58	16	9.2	.0001***
geography and physics	57	18.8	10.6	.0001***

According to the results obtained, geography is really the most popular science at school in Finland. It was surprising, too, that there is such a clear difference between geography and biology. The situation with chemistry and physics could be expected in the light of other research done in Finland earlier (Rikkinen 1987; Kansanen & Uusikylä 1988; Perho 1988; Aittola 1992; Kari 1993). The teaching of physics especiallly has been in crisis for quite a long time.

The results on geography have been examined more closely (Fig. 2). Of course, there are differences between the respondennts, but the means of the ratings are on the positive side of the scale, anyway. The most positive attributes that the largest number of respondents chose were gripping, important, interesting and broadening. Not bad at all!

The associations with geography

On the question what the word "geography" brings to mind, the respondents gave various kinds of answers. These expressions can be divided into the following categories: physical geography, regional geography and cultural geography, the planet Earth or the globe, a map or mapping, the environment and the teaching.

The first category, physical geography, got the highest number of mentions, 61 altogether, including different kinds of natural phenomena, from the systems of rivers and lakes to the soils and varying concepts of the climate and the weather. Regional
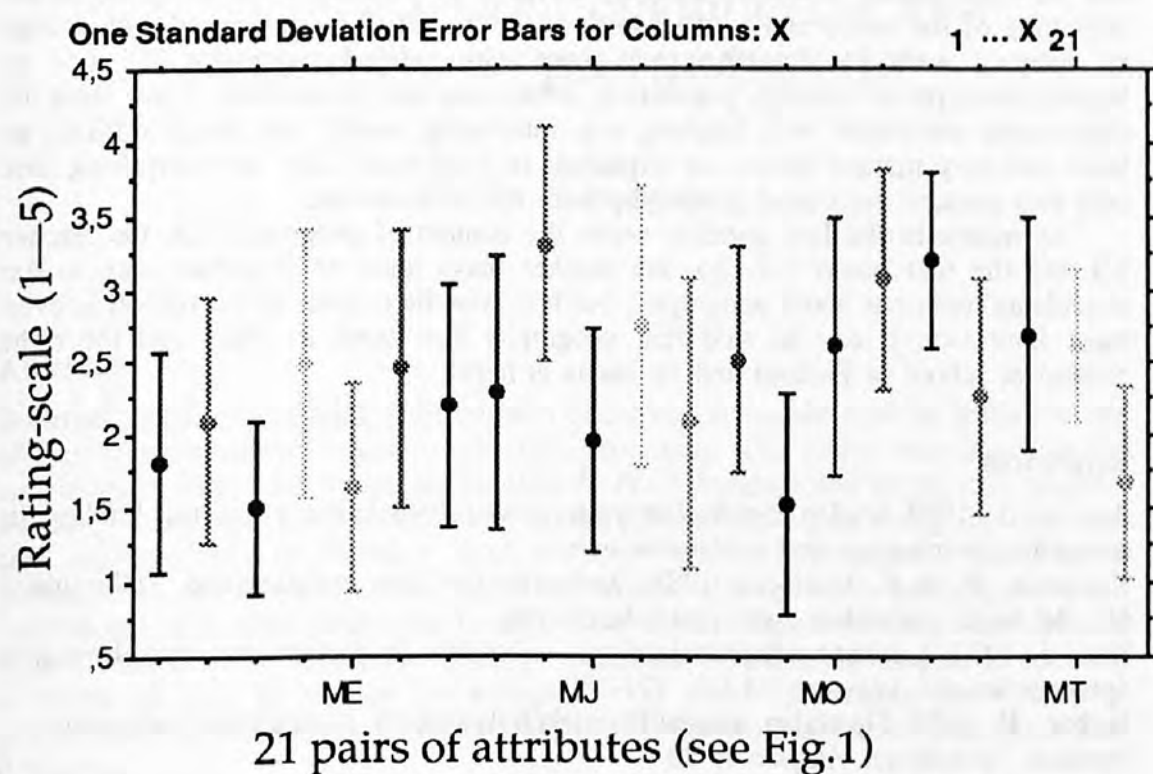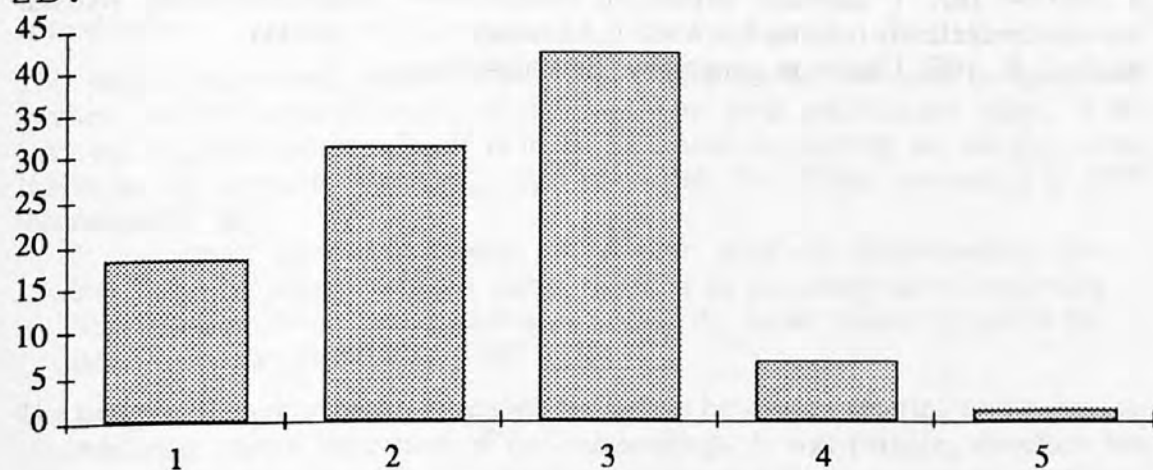
Figure 2. 2A.The means and standard deviations of the ratings on the semantic profile (Fig 1) of geography. 2B. The quantity of the rating points (%) from the positive (1) to the negative (5) values about geography.

geography got 41 mentions ranging from the names of states or countries to cities and the local places. The third category includes 24 mentions from the globe to the beginning of the world and to the world view. The mentions associated with a map or mapping were 21 altogether, and those with cultural geography 15, such as varying concepts of cultures, population, inhabitants and occupations. There were 10 expressions associated with teaching e.g. interesting, useful, the things difficult to learn and easy matters which are explained in a difficutlt way. It is surprising that only two persons associated geography with the environment.

The means in the last question were: the content of geography 2.5, the teacher 2.3 and the text books 1.7. So, the teacher plays quite an important role in the respndents' opinions about geography, but however the content of the subject is even more important. It can be said that geography has found its place and the right content at school in Finland and its status is high.

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THE RELATIONSHIP BETWEEN THE INTENDED AND IMPLEMENTED CURRICULUM AND THE ISSUE OF TEACHING STYLE

Philip Stimpson

Abstract

Informal, open, experiential, pupil-centred classroom styles are seen as preferable for effective environmental education through geography. The paper examines how far and in what ways such styles are employed. Three hundred and eighty-one teachers in Hong Kong completed a self administered questionnaire examining the openness and indirectedness of teaching style primarily within a framework of Gagne's instructional events. Opening phases in lessons tended to be open, indirect and pupil centred but as lessons progressed became more closed teacher directed, bookish and examination oriented. The relative inappropriateness of the style adopted is not seen in terms of lack of teacher knowledge but in terms of teacher perceptions of practicality and in a tendency to adopt satisficer strategies to accommodate short term demands.

Introduction

This paper is concerned with the teaching of environmental education by geography teachers and the appropriateness of the classroom style practitioners adopt. If the teaching of geography in schools is to be successful in meeting the environmental challenge, the question of teaching style is critical. The Tbilisi conference in 1977 recommended that:

Environmental education should not confine itself to disseminating new knowledge but should help the public question its misconceptions concerning the various problems of the environment and the value systems of which the ideas are a part (UNESCO, 1980, p.26)

The purpose of environmental education became to be seen as centring on the process of developing critical awareness of our surroundings. It was perhaps, therefore, not surprising that Bailey saw EE as at times synonymous with environmental education. However, as is well accepted now, education *for* the environment is at the core although this is not to say that there is not a need for knowledge *about* the environment but rather to distinguish means and ends. Such a goal, stressing values and attitudes, presumes an informal, open, participatory, experiential, thought inducing, student centred classroom style (Tomlinson, 1986). This paper reports a study of the degree to which such intentions are implemented in practice through an analysis of the classroom behaviour of geography teachers in Hong Kong.

The shortcomings of an overemphasis on cognitive objectives, and in particular on acquiring knowledge about the environment, at the expense the affective and

behavioural are well recognised (Huckle, 1983). However there is little empirical research evidence which tells us what are the most effective approaches in the classroom. Indeed findings circulating at present often are contradictory; for example, some workers have found that the use of simulations enhances environmental awareness whereas others have suggested they add little Fennessey et al., 1974; Bottinelli, 1980). One problem with such studies is that they ignore the context of the classroom environment as a whole and thus it is not surprising that seeming contradictions arise.

Whilst there is little evidence to look to advise on classroom activities and style, the strategies used in practice are crucial. In many educational systems, the aims and objectives of environmental education are not a matter for decision by individual geography teachers. Environmental objectives for schools are often stated in the official documentation of the intended curriculum. In many cases today, engendering appropriate environmental values is at their core even if they are always not so readily apparent at the level of specific learning targets. The curricular problem, then, is the way the objectives are interpreted and the sorts of classroom experiences geography teachers feel are appropriate as a consequence.

One of the strongest influences on a geography teachers' planning of lessons is their perceptions of the subject matter and the type of knowledge it represents. The perceived priorities of teachers lead to the adoption of particular classroom approaches. At the same time, those approaches teachers feel most comfortable with influence what they perceive as feasible to teach and thus by implication the objectives they stress. This interaction and the compromises it inevitably entails is a major factor which can lead to a mismatch between what is intended in the environmental curriculum and what is implemented in reality. Fullan and Pomfret (1977) highlighted this in pointing to the importance of value internalisation and the acceptance of pedagogical implications.

The paper describes the classroom style adopted by teachers of geography in Hong Kong when dealing with environmental topics. However, the actions of teachers in solving questions about how they should organise their work cannot be separated from the broader issue of the system in which they work. Of particular importance in the context of environmental education in Hong Kong which influence what goes on in schools is the nature of the education system and the external examination system. Thus before looking at teaching style and its match with the aims of environmental education, it is first necessary to provide some background on the education and assessment systems in Hong Kong.

The Hong Kong Education System and Environmental Initiatives

Hong Kong operates a highly centralised education system with territory-wide curricula for all but the few children in international schools who follow that of their home country. As Morris and Marsh (1992) have pointed out this leads to problems that are created by any bureaucracy but also creates a positive means of providing uniformity of provision, common goals and protecting schools from the demands of various pressure groups. Schools have control over such matters as choice among approved texts, use of non text materials the classroom approach adopted in an attempt, as McClelland (1991) put it, of grafting increased teacher professionalism onto a centralised bureaucratic system. Teachers have largely been kept out of the policy making arena and have accepted a dependent role. Where there is teacher

participation in the central planning committees, it is not a leading role. Curricula which are derived from those committees are nominally recommended curricula but for all practical purposes are mandatory. However this is not to imply that recommendations do not constitute good practice or awareness of worldwide trends. The main problem is the slippage between general policy aims and implementation.

Within this framework environmental education has been long in gestation and slow in take up. Educational provision has often been seen largely in terms of creating infrastructure for the economy (Sung, 1989) and new initiatives in the 1960s and '70s were directed towards technology education (Lee, 1991). Environmental quality was viewed as a luxury and environmental education as marginal although environment was nominally an organising concept within the 14-16 and 16-19 geography curricula and warranted a place biology. However, by the mid 1980s, air and water pollution reached a level of public concern that the Governor of the time, David Wilson, promoted the environment as a central concern for the territory and it was added to the educational agenda.

The Education Department responded to the challenge with a number of initiatives both of a cross curricular nature and within subjects. These have included the promulgation of a set of cross curricular guidelines and the introduction of an environment module within a grade 12-13 Liberal Studies programme and an ill fated grade 10-11 Environmental Studies course of study for non-academic children. Most progress has been made within traditional school subjects and in particular within geography; hence the focus of this study.

Overall, the curriculum development process in which these initiatives have arisen has many similarities with the authority decision making framework suggested by Rogers and Shoemaker in which teachers have no option but to implement whether or not they accept the implication of new curricula. As Marsh and Hill (1984) found in an analogous situation in Western Australia, the only action open to teachers are adoption of different ways and levels of implementation of the new environmental components in the curriculum which accord with their views of the job. Hence the importance of perceived teaching style in issues of implementation.

External Examinations and the Implementation of Environmental Education

Within the Hong Kong education system there are external examinations at 16+, the end of grade 11 which is the point at which most students leave formal education, and at 18+ (end of grade 13). In general most students staying through a particular level will take the relevant examination. At grade 11, this constitutes about 85% of the age cohort and 25% at grade 13. However the influence of the examinations are felt either directly or indirectly at most stages of secondary education (grades 7-13).

These public examinations have had a major influence on the nature of environmental education in Hong Kong schools. This will be illustrated by two example. Firstly, the Environmental Studies programme for grade 10-11 noted earlier failed to receive support from schools because initially is was deemed a non-examination course for non-academic students. Head-teachers felt it would not be accepted by parents and rejected it. Secondly, when the grade 10-11 geography curriculum was revised in 1985, an environmental perspective was adopted using an issues based framework. Within the examination 25% of marks were allocated to the assessment of students knowledge and awareness of the issues. Whilst less emphasis than some would have

given, it was now clear what was expected and the examination had a potentially positive role in affecting curriculum change.

The examination is, has been found in Hong Kong, often critical particularly where there is an absence of specifically stated objectives for examiners to follow. In these circumstances, examiners may tend to exercise personal predilection for certain types of question. Often questions mirror previous practice and consequently new initiatives are not supported and inappropriate messages are sent out to schools.

The Study

A self-reporting questionnaire was designed to examine the teaching styles used by geographers involved in environmental education. This complements work by Helen Spork in Queensland Spork, 1991) and by Lee in Hong Kong (1993). Whilst Spork's and Lee's studies were at the curriculum/programme level, this investigation concentrates on the lesson as the unit of analysis. The conceptual framework underpinning it was based on Adams' organisational characteristics and Gagne's eight elements within an instructional/teaching event. The use of a Gagne framework is not without is difficulties not the least because original focus on the cognitive domain. However it offers the advantage of providing a framework for examining the various elements of a lesson. The twelve criteria in total are given in Figure 1 below.

1. Organisational differentiation
2. Control source
3. Control mode
4. Mode of interaction
(Adams, 1970)
5. Activating motivation
6. Informing learners of objectives
7. Directing attention
8. Stimulating recall
9. Providing learning guidance
10. Enhancing retention
11. Promoting transfer of learning
12. Eliciting performance and providing feedback
(Gagne, 1975)

Figure 1 Criteria used in the analysis of teaching style

Sixteen situations were created to examine teacher behaviour on an open-closed continuum with respect to each of the 12 elements listed above. Participating teachers were asked to select one of three likely alternative behaviours of varying degrees of openness. A background questionnaire was also included.

The questionnaire was sent to all anglo-chinese and chinese middle schools offering the grade 10 and 11 environmentally based geography Certificate of Education course in the territory. These teachers were selected because, in the absence of a separate environmental studies course, the grade 10-11 geography reflects probably the most environmentally explicit programme within the school curriculum and, moreover, it is widely studied by about 35,000 students each year. Some 381 questionnaire were returned from 282 out of 388 schools offering Certificate level geography. This gave a return rate of 73%.

Nearly two-thirds of the teachers who replied were women and most were experienced teachers with between 6 and 20 years of service. Most were professionally qualified graduate teachers who held some sort of responsibility post in their schools. Few, however, were either directly involved with environmental groups outside the school or engaged in environmental protection activities within the school. In other words, the environmental commitment among the teachers who replied was, as might have been expected, very variable.

Results

Percentage responses to the behavioural options for each situation are given in Table 1. In getting the attention of students and motivating them to become engaged in environmental topics, teachers see themselves and their teaching style as largely student centred. There is indication of a move to resource based leaning. Similarly in discussion when attempting to stimulate recall of earlier learned ideas, their approach is to provide encouragement rather than criticism. The appearance of openness is also apparent in organising classes where the concept of differentiated student work by task is accepted and where free communication between students is encouraged within a democratic approach to issues of classroom rules. Such responses are indicative of a broadly open approach to running lessons in which an indirect manner of teaching is adopted.

There were, however, contradictions. Overall learning tended to be seen in a compartmentalised way. Integration within the subject area and thus presumably across the various environmental issues under discussion was not strong. Integration across subjects was rare indeed. Values development when it occurred centred on the more neutral values analysis; action learning was not a preferred option. Nearly one quarter saw values inculcation as the way forward. In assessment exercises teachers rarely tended to emphasise the affective but rather to concentrate on the cognitive. Homework was as often examination orientated (and hence, as a result of the formal nature of public examination questions, focused on knowledge) as it was directed towards students applying ideas to their daily lives. The examination was clearly a major influence on many teachers and the cognitive rather than values or attitudes orientation of most questions seemed to have an important effect on the sorts of work set when attempting to consolidate learning. The result is likely to be the development of a conventional and neutral form of environmentalism.

Conclusion

The impression to be gained from the observations suggest a mixture of styles within a lesson. At the beginning of a lesson, the teachers tended to be open, participatory and experiential. Pupil involvement was encouraged. However, as lessons progressed, the style became more didactic, teacher centred and 'bookish'. There was concern to ensure that points were covered and that pupils received suitable preparation for formal tests lying ahead. It would be easy to dismiss the approach a largely incompatible with the stated goals of environmental education and to suggest that the teachers showed little appreciation of what is advocated by environmental educator as the preferred style. Hong Kong geography teachers are by tradition didactic. This is perceived as the accepted "chinese way" of teaching in which formal schooling is equated with knowledge acquisition, a view supported by Au (1989) in his study

Table 1   Percentages of Teachers by 'Most Likely' Course of Action

Table 1   Percentages of Teachers by 'Most Likely' Course of Action

Classroom Emphasis	%		%
(1) Activating motivation:		(9) Transfer of learning (Valuing Process):	
A. Extrinsic (Punishment)	2.7	A. Vertical transfer: inculcation	22.9
B. Extrinsic (Reward)	18.0	B. Lateral transfer : value analysis	67.9
C. Intrinsic	79.3	C. Lateral transfer : action learning	9.2
(2) Informing learners of objectives:		(10) Promoting transfer of learning through integration of subject matter (s.m.):	
A. Not informing objectives	10.1	A. Vertical transfer: separate s.m.	56.6
B. Informing objectives explicitly	18.0	B. Lateral transfer : separate s.m.	33.6
C. Informing objectives implicitly	71.9	C. Lateral transfer : integrated s.m.	9.8
(3) Types of objectives:		(11) Eliciting performance by assignment:	
A. Irrelevant objective	4.0	A. Cognitive and exam-oriented	42.5
B. Cognitive objective	82.2	B. Cognitive and affective	36.7
C. Affective objective	13.8	C. Affective and action learning	20.8
(4) Directing attention (teaching approach):		(12) Providing feedback:	
A. Exposition	29.3	A. Very delayed and summative	9.8
B. Guided teaching	45.3	B. Delayed and less formative	16.2
C. Open inquiry	25.4	C. Immediate, prompt and formative	74.0
(5) Stimulating recall:		(13) Class organization:	
A. Provide no cue; give criticism	5.8	A. All pupils work on the same task	1.5
B. Provide no cue; give direction	23.3	B. Different groups, same task	15.0
C. Provide cue; give encouragement	70.9	C. Different groups, different tasks	83.5
(6) Providing learning guidance:		(14) Control source (Leadership style): Class rules determined by	
A. Verbal statement	23.3	A. teacher alone. (Authoritarian)	4.6
B. Photos, slides and videos	70.9	B. teacher and pupils. (Democratic)	91.7
C. Field Study	5.8	C. the pupils alone. (Laissez-faire)	3.7
(7) Enhancing retention by assessment:		(15) Control mode: The rules in the class state	
A. Cognitive and structured	37.6	A. what must be done.	3.4
B. Cognitive and open-ended	44.7	B. what must not be done.	56.3
C. Affective and open-ended	17.7	C. what may be done.	40.3
(8) Enhancing retention by homework:		(16) Interaction mode:	
A. Didactic	4.0	A. Teacher dominated communication	31.8
B. Examination-oriented	50.4	B. Teacher-pupil communication	20.5
C. Open-ended (daily life example)	45.6	C. Free communication among pupils	47.7

of the expected role of teachers in Hong Kong. The mixture of a traditional teacher centred approaches and a more open student centred approach exhibited in lessons perhaps reflects the cosmopolitan atmosphere of Hong Kong. Perhaps more importantly, the style observed reflects the way teachers do in fact understand the need for an open, participatory, questioning approach. They are not unaware of what might or could be but within the system in which they work they make compromises. The teacher may rarely read environmental education journals but they are well aware of the broad issues involved in teaching values laden subjects. The findings express what teachers see as the necessary approach given their confidence and knowledge to implement change, the situation in their schools and the expectations of schooling by Hong Kong society. They are pulled between a vision of how environmental topics can be taught within geography lessons and the more pragmatic realities of the present.

Environmentally committed curriculum developers in their enthusiasm often seem to forget, or ignore the realities. Fullan (1991) went so far as to claim that strong commitment to reform from outside the school setting constitutes a major barrier to change. He argued that the adage where there is a will there is a way is definitely not apt. With great simplicity, he noted that often "there is an abundance of wills but they are in the way rather than to the way". This seems to be part of the problem in Hong Kong. Geography teachers undertaking environmental work in the territory's schools are faced with many competing ideas of what is the most appropriate way they should organise their lessons. There is the fallacy of rationalism that change can be brought about by force of argument concerning what is the "right way" to conduct lessons. Teachers are faced with a complex interacting, often conflicting, set of demands, not the least among these is the fact that the style being advocated in environmental education differs radically from that adopted in most other subject on the timetable. It is not surprising that what is reported about actions in classrooms is inevitably some form of compromise.

Acknowledgements

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INFORMATION ACCESS AND USE: USER FRIENDLY GIS IN ENVIRONMENTAL EDUCATION

Ove Biilmann, Poul Brøndum, Tonny Hübbe, Keld Juhl Larsen

Abstract

Educational GIS[1] is discussed as a contribution to environmental education and as a compensation for users´ lack of geographical knowledge and skills. That leads to considerations with emphasis on the didactics of software development and georeferenced datasets. It is important to address these issues, while they are important didactic fields as well as bottlenecks for further educational and information dissemination use of GIS. The article is primarily based on experiences and some findings from the IMPACT II definition project ENVIDUCATION[2]. Methodological and other considerations are explorative rather than leading to conclusions. Nevertheless, they might sketch a frame for further work in two core areas of the geographic educational tradition of importance to multimedia didactics.

1. Introduction: Awareness, information and knowledge

Global issues and major problems in a fast changing world are reported and sometimes also thoroughly reviewed by the news media. Nevertheless, it is still more difficult for education to catch up and to provide students and citizens with relevant and appropriate background knowledge, skills and overview. Public as well as corporate understanding of the environmental changes and of their impact on the quality of life and resource management are often restricted by lack of relevant knowledge or lack of sufficient and up-dated information. Thus, there is a need for user-friendly information access systems applicable to education and public information communication.

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[1]The potential of Geographic Information Systems (GIS) and remote sensing is illustrated in pamphlets, such as:
UNESCO Environment Briefs: New Technologies. London: UNESCO 1992 & GRID. Bridging the gap. Nairobi: UNEP 1993.

[2]ENVIronmental eDUCATION

Limited public environmental awareness should provoke further development of information dissemination combined with attempts to compensate for current educational shortcomings. It may make sense to consider this demand for common or globally shared environmental awareness and knowledge - a sort of common environmental literacy (Biilmann, 1988, 133) - in the light of the developing potential for progress through user-friendly information access, GIS and appropriate educational initiatives. The same goes for knowledge and information needs in companies or different governmental or local bodies.

2. Strategies

There is no easy or simple strategy for improvement. It is commonplace to argue that environmental education at schools should be strengthened or to ask for a revived geographical education. However important initiatives of that kind may be they will at best provide a part of the sufficient answer to the current challenges (Hirsch, 1988, 127-33).

Given this state of affairs user-friendly provision of environmental or geographical information and analysis hereof as a compensation for missing knowledge and skills seems to offer one of the better ways of improvement. A similar approach may cater for other still growing demands for varied and updated georeferenced information. Appropriate and sufficient information provision is a prerequisite to a public environmental awareness and knowledge strategy applicable to a variety of fields and problems. The same applies to professionals' and civil servants' demands.

GIS as a resource for education has been discussed for years. The discussion is summarized by David Rhinds suggestions about educational relevant questions and implication for geographical education (Rhind, 1993, 152 and 157-59 respectively).

Educational work with information access and GIS has predecessors; e. g. the GRID (Global Resource Information Database) and UNITAR (United Nations Institute of Training and Research) initiatives and achievements in GIS knowledge and technology transfer to less favoured regions (UNITAR Report of Activities 1993, 27-37, UNITAR AFRICAGIS'93 DOCUMENTS). We wish to participate in GRID attempts to "bridging the gap". We agree that "A more progressive contribution to automated geography to society requires the discipline to use its own knowledge in this area to provide consultancy and training in automated geography to those who need it most, not to those who are paying the most. The latter will obtain it with or without our help." (Sheppard, 1993, 460).

Nevertheless, it must be stressed that information, knowledge and skills are connected. Information alone will not suffice. Implementation, marketing and use of tools and services providing information access, analysis, and representation needs support. On-line support as well as education (such as courses, in-service and further education, and distant education according to target groups) are prerequisites to successful development of public (and on-line) information services.

Considerations along these lines contributed to the rationale for an educational development including software development and evaluation carried out in Denmark, Greece and Ireland in the frame of an IMPACT II definition project[3]. The project was among other things based on earlier educational developments and geographic didactic

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[3]See "Enviducation Educational Development and Evaluation reports 1993,1,5-11 and 1993.2.

work at the Royal Danish School of Educational Studies (Biilmann 1989, 257-58). These traditions and experiences where prerequisites to planning and implementation of such complicated developmental efforts carried out in different curricular and national settings.

The project, the experiences, and some findings are thoroughly described elsewhere (Biilmann, 1993). This article only reports on and discuss two issues. The discussions are explorative rather than leading to conclusions. Nevertheless, we find these considerations worthwhile because their issues may represent important didactic fields as well as bottlenecks when educational and other information dissemination use of GIS (or multimedia) develops further. They are:

– Didactic aspects of software development;
– Dataset didactics as an important aspect of database use and information provision;

3. Didactic aspects of (GIS) software development (1)

Educational developments and research in school environments (classrooms, libraries) are prerequisites to development and evaluation of software. The same applies to information access. Thus, the developments in the definition project was based on the following vague working hypothesis[4]:

The framework for educational software development including system specifications- and design of user-interfaces[5] must be based on didactic knowledge, analysis and development.

In consequence the iterative software development[6] was carried out in close contact between programming, systems analysis and educational development (including tests and evaluation) in school environments (Biilmann 1993, 6-11, Biilmann (ed), 1993).

We are convinced that educational qualities of software and information access as well as of text- and workbooks first and foremost are obtained by virtue of integrated or at least close connected educational, systems and software development carried out in a didactical well considered framework.

These not very surprising viewpoints and experiences emphasize the difference to the opposite approach; application of existing powerful GIS software to e. g. elementary school use. It is feasible and may easily be very common. After all it is aspects such as, user-interfaces and facilities and their organization which makes the difference - not the way in which the facilities are programmed.

In consequence, it would be advantageous if educational experiences and findings from developments made in close co-operation between geographical educational-

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[4] Experiences as well as common sense seems to confirm the efficiency of our integrated educational and software development practice. That applies to the educational qualities of the software as well as to the teachers experiences from practical education. We for obvious reasons do not claim that anything has been literally proved, but we intend to proceed along these lines and develop the approach further.

[5] Initial system description and interface design was made by Keld Juhl Larsen.

[6] Erik J. Hansen "Jydsk Telefon" was in charge of GIS programming as well as of the revisions hereof carried out through the process.

ists, schools, systems planners and programmers were utilized if and when the more powerful systems (companies) take over. And even more important: that this sort of collaboration as well as educational development at school and systems level continues in a mutually supporting way.

Educational discussions in GIS-circles more or less can be the labelled considerations on GIS training. Problems and possibilities about how to learn various groups of professionals, scholars or university students to use that or that GIS-software have played a major part. No wonder and no reason for criticism while practical questions normally are answered in a pracmatic way[7]. The same to some extent applies to courses and support aiming at introduction of GIS knowledge or technology across all sorts of contextual barriers.

Schools, libraries and various public services need education with GIS; that is GIS as an educational or public information mean. It is that challenge we try to address. It is a field which benefits substantially if and when collaboration or integration of the GIS software companies' huge fund of technology and competence collaborates with or are integrated in the preliminary or tentatively emerging GIS didactics and educational developments.

4. Didactic aspects of (GIS) software development (2)

Following didactic comments on some aspects of the ENVIDUCATION project. The frameworks and guidelines for educational developments applied to various practical issues as well as to curricula and some basic principles hereof. Thus, the work contained a lot of compromises which may look as a contrast if not a withdrawal compared with traditional didactic wisdom. Quotations from the rationale are used as brief look into the didactic considerations. The hole exercise of introducing didactically based GIS and information access in education "addresses user-friendly provision of geographical information and analysis:

- as a contribution or support to geographical, environmental, geopolitical etc. education;
- as a compensation for users' lack of knowledge and skills;
- as a public information service."

That task represents serious challenges caused by contradictions between public wishes or expectations and students' or other users' achievements and poor previous knowledge. This endeavour is an attempt to support more or less geographically illiterate users' try to cope with geographical analysis and assessment. It is a search for a cost-effective short cut to overcome widespread shortcomings in general education. This challenge poses didactic questions to geographical education, GIS software, database access, datasets and other sorts of information. That kind of goals deserves to be considered and discussed thoroughly from ideological, educational and practical, including technological, viewpoints. They also pose more detailed didactic questions to GIS software, database access, datasets and other sorts of information.

Ontological or political assumptions inherent in didactic theories and frameworks prevent testing of these. Thus, normative didactic practice depends on wishes and possibilities rather than on confirmed knowledge or systematically collected experien-

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[7]As illustrated in for example EGIS conference proceedings.

ce. Thus, we as a further illustration refer to three assumptions of importance to the practical didactic efforts in the ENVIDUCATION context:

"- curriculum development as well as many didactic considerations and decisions are based on domain, subject or topic specific knowledge and skills. That applies to cross-curricular work as well as to developments in the frames of school subjects; - adaption to the needs and preconditions represented by different user or student groups or contexts are prerequisites to didactics and to education and information mediation implementation. It must address e. g. students, teachers and librarians with or without environmental, geographical or informatics preknowlege. That which provides different challenges to computer and software use, instruction and support; - the current situation is unique in the sense that many and later all students are computer literate while many adults only have superficial if any knowledge about computers and informatics. Thus, information dissemination and education aiming at various adult population segments may be important for these groups' participation in social life or for their capability to stay employed" (/Biilmann, 1993, 5).

In principle didactic assessment and decisions-making should be governed by aims and goals. Thus, the comments on choice of datasets for educational use until now turns the didactical process upside-down. Realistic assessment of economic constraints as well as of the well known fact that didactical analysis and decisions-making normally works in networks of goals and means rather than in hierarchies, served as our rationale for this pragmatic approach.

Following an attempt to delimitate and explore procedures and assessments of importance to development and dissemination of georeferenced information for educational and information dissemination purposes.

5. Dataset didactics (1)

The first ENVIDUCATION database reflects a compromise between the datasets offered by GRID and wishes based on knowledge or experiences from earlier educational developments. The pilot dataset sample covers **Africa**[8]. A few regions - Senegal, Mauritania, Morocco are illustrated in **larger scales**. The regional coverage of educational developments in classroom and library environments more or less were defined by the pilot datasets. **World datasets** were primarily used for comparison or overview purposes.

The datasets supports education in a variety of themes under headings such as geography, ecology, international studies, environmental studies, geopolitics etc. Themes such as resource management, changing environments, and population problems are supposed to be inherent in the content or organize education.

Representation or analysis of regions are another important educational dimension while regional descriptions are inherent in all kinds of geographical organized education or information dissemination. The majority of textbook or newspaper articles on countries, places or environments are concerned with fragments of the Earth's surface; i. e. regions. GIS as such is a device for regional analysis and it is based on traditional spatial analysis. The notion and practice of local studies was inte-

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[8]Datasets from "Global Change" distributed by GRID.

grated in the educational development for obvious reasons. Only two grounds are mentioned here:

- integration of or comparisons between different scales reflects basic geographical qualities and challenges imbedded in all education and information dissemination;
- while the datasets normally only covers the Global, Continental and National scales the local area must be represented by other means or sources - large scale maps, air photographs or the students' own measurements or other local data[9].

The ENVIDUCATION definition project was an early stage in an iteraetive developing process aiming at a user-friendly GIS representation of continents, countries and regions for educational and public information dissemination purposes.

Planning and implementation of educationally grounded choice, organization, analysis and presentation of georeferenced information revitalize important questions known from geographical research, epistemology and education. Didactic development and research in (primarily georeferenced) dataset are based on the merging tradition of geography, cartography, and informatics; ranging from computerized spatial analysis and other classical geographical enterprises to remote sensing. Healthy reconsideration of geographical thinking, practice, and education may prevent us from doing too many reinventions[10] or repeating too many earlier mistakes.

Development of a didactically sound comprehensive GIS based presentation of the World and the Continents or of important Global and regional issues represents an important co-operative challenge. That process, among other things develops procedures for educational analysis and processing of georeferenced information, delivery procedures and user interfaces, curricula (such as content and organizational frames, educational modules, evaluation procedures), and other media. These achievements might be utilized in very different areas, such as:

1) primary and secondary education (geography, international and social studies etc.);
2) public information and general education incl. libraries;
3) pre- and inservice education for ministry, organization and company staff members, assigned to e. g. less favoured regions or to work on environmental, resource etc. issues;
4) support and education for news communication;
5) pre- and in service education for professionals from international organizations or less favoured countries who use or develop GIS based planning, research, decisions-making etc.,
6) staff education and innovative support for education and general education in less favoured countries.

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[9]The GEOBASE software includes facilities for presentation of satellite images and "local" georeferenced datasets.

[10]Educational occupance with GIS may lead to educational reinventions just as GIS seems to lead to revisits if not reinventing of established geographical principles. We experienced that also educational ".. attempts to utilize GIS as means for handling compex real-world situations has illuminated a number of conceptual problems that had laid dormant in the discipline.." (Marble & Peuquet, 1993).

7) evaluation and probably improvement of curricula, organization and presentation of training or information in areas such as environment and GIS.

Media, courses etc. (1-4) may in an early stage target Danish (Scandinavian), Irish, German or Greek users. Design and mediation across language and cultural differences imply various obstacles and difficulties, which are addressed through the process.

The following comments on datasets and data quality address the user-friendly provision of geographical information and analysis quoted above (4).

6. Dataset didactics (2)

Georeferenced information, especially datasets, are normally used by a limited and qualified user population. It is no simple matter for data-holders to address and support new and broader user circles. In consequence, the simple and pleasant wish to support secondary or even primary schools, various sorts of vocational or voluntary adult education, or public information already in agreement and planning stages must be translated into a variety of tasks. Tasks of that kind were assessed, described and addressed according to size, demands and resource needs during the ENVIDU-CATION definition project. A practical and reliable outcome of these efforts seems to be as valuable for data-holders as well as for potential users. Many data-holders need assessments of their own information offers as well as of their capability in information (re)presentation and dissemination.

Thorough didactic analysis of datasets may show deficiencies in supply and form compared with the wishes and needs of different user populations. The following frame work facilitate data assessement and organization according to fundamental geographical dimensions[11].

The following preliminary specification devised for GRID World georeferenced datasets illustrates one possible use of this didactic frame of reference.

Use of datasets for educational or public information dissemination adds extra demands to the normal data quality standards. Information representation from datasets may not be too inferior compared with for example printed atlas maps. Shortcomings have to be explained and compensated by additional information or support. Dataset analysis and representation should be suited for comparisons with other information sources - books, atlases etc.

It goes without saying that datasets normally have to be changed according to format, delimitations, legends etc. through the processing and preparation phase. Explanations will have to be extended and rewritten. Supplementary materials must be developed or found, assessed and integrated in the total information offer.

In an ideal world examination, choice and assessments of datasets should be a part of a broader didactical analysis directed towards planning of educational or information dissemination planning and implementation. Didactical assessment and decisions-making normally are governed by aims and goals. Thus, the comments on datasets for educational purposes to some extent turns the didactical process upside-

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[11]Attempts to delimitate or organize information according to geographical (and geometrical) principles are not new (Berry, 1964, Bunge, 1966). The same applies to didactic content organizations where similar principles are inherent (Bülmann, 1977, 137 & 139 Abb. 2)

CONTENT / THEME:

Topics / systematic themes

Georeferenced data (sets)
- Raster
- Vector

Non-geo-referenced information
- Raster
- Vector
- Figures
- Pictures Video ....

AREA / SCALE
- World
- Continents
-
- States
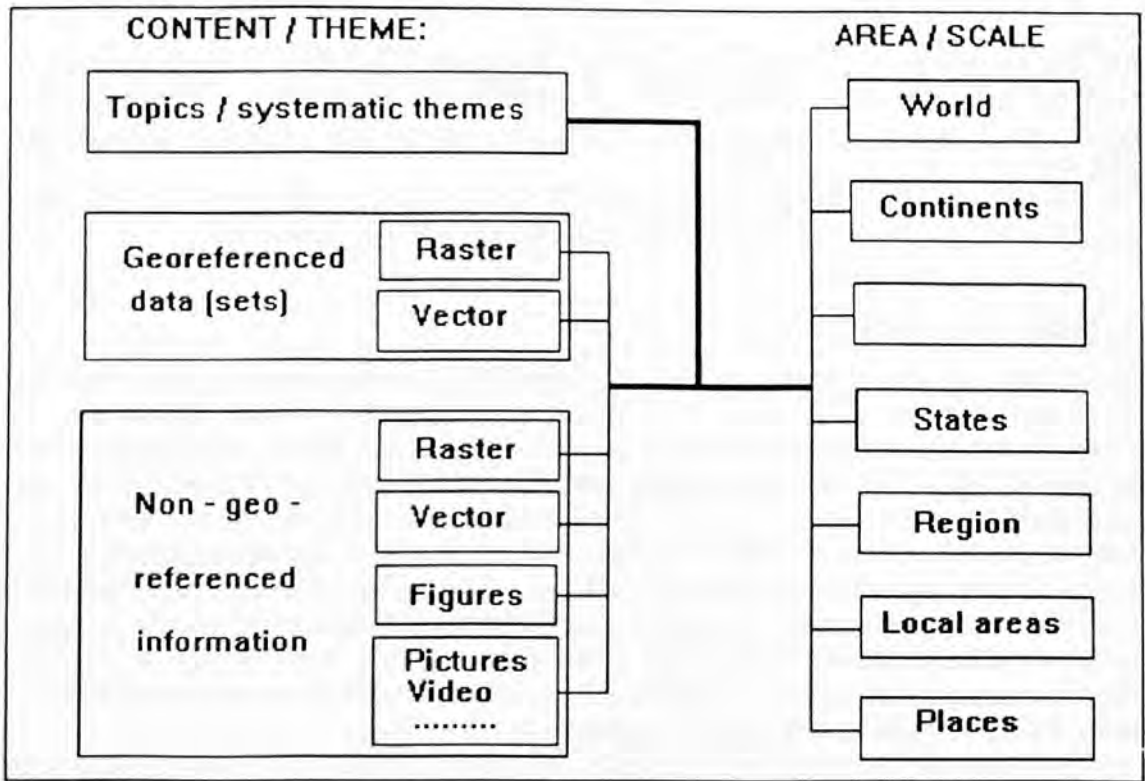- Region
- Local areas
- Places

Figure 1

down. That applies also to the emphasis on public domain georeferenced information sources imposed on i. a. the ENVIDUCATION concept by financial constraints. Such limitations by virtue of necessity are common in work with educational information access, analysis and representation.

Thorough examination often show that thematically relevant datasets - or representations and analysis hereof - are educationally inferior. Their mediation performance may be poor and cannot compete with sensible use of atlases or topographic maps. This depressing conclusion occasionally contributes to a sound evaluation of two different but interrelated aspects:
- the practical use of informatics in education and information dissemination;
- the realistic educational and education dissemination potential of environmental, resource and geographical databases.

The communicative potential of datasets goes far beyond the educational realm. Considerations on datasets' value for various user populations must be topical for data-holders. The same applies to the way in which data can be represented. In both cases a comprehensive didactical analysis will pay off.

This is elucidated further when we as a simple example look at various educational GIS representations based on different sorts of information:
- (1) Raw satellite images such as, different NOAA, Landsat, or Spot channels. These images enable the user to work with detailed and updated information on the area covered by the images. Access to image time series provide the user with the
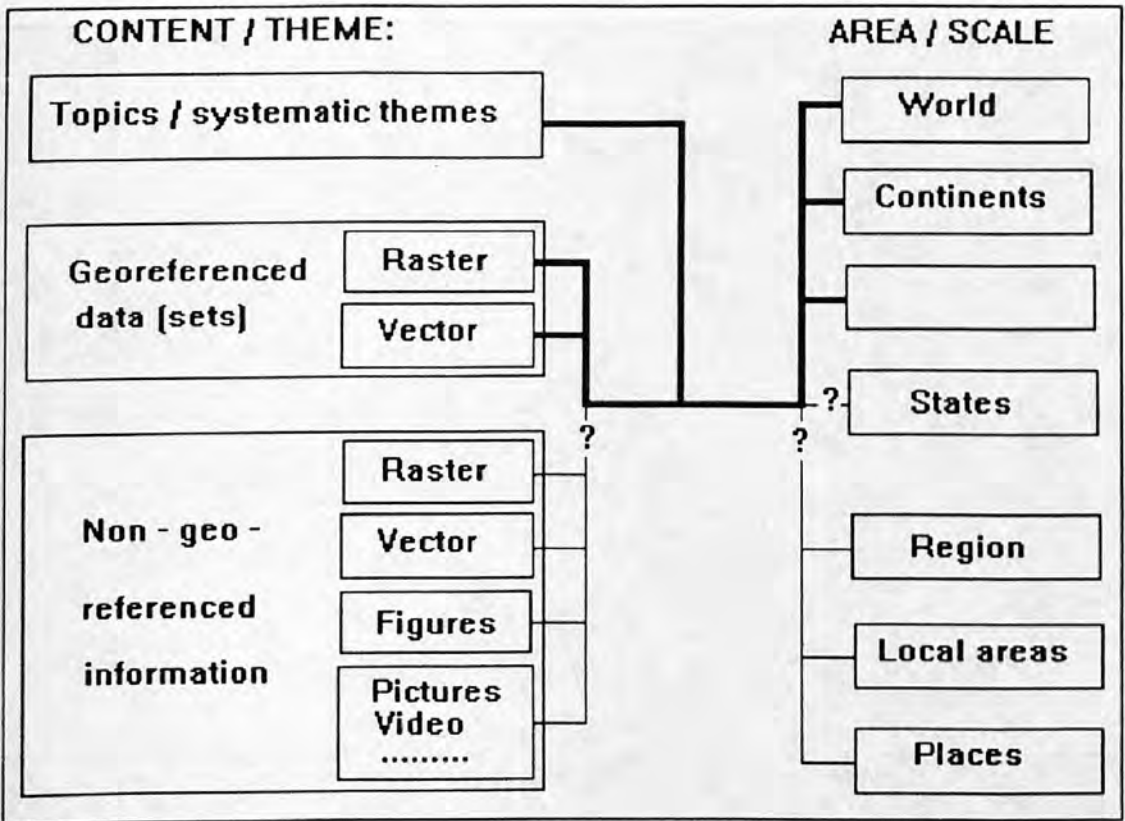
Figure 2

opportunity to study e. g. land cover changes. Skills in interpretation of the relevant channels are prerequisites to these studies: i. e. ability to "translate" the grey colour nuances of an images to "real world phenomena", such as the water, the clouds, and the vegetation, they represent.

Four channels raw NOAA satellite images from Rondonia. The dark areas on channel 3 and 4 shows where the rainforest has been burned down to establish cattel farms. Smoke from the fires can be seen on channel 1 and 2. Source UNEP/GRID.

Image information mirrors various absorbtion and reflection patterns of sun and earth heating. Thus, various surfaces' or land covers' different radiation, absorbtion, or reflection must be familiar to the raw image interpreter. In consequence, provision of information linked to every image or general background information in textbooks or on the screen are prerequisites to sensible educational use of raw image data.

– (2) Knowledge of the absorbtion and reflection pattern of different land covers in e. g. NOAA- satellite channel 1 and 2 enables a user to interprete NVI-data. These NVI-data are extremely valuable for a scientific or in other way competent user population. Their use in for example global, continental or larger regional environmental studies can hardly be overestimated.

Thematical map based on the statistical informations in GeoBase.

In an educational context the NVI-data despite their thematic and visual appeal demands comprehensive support; e. g. explanatory and background texts, supplementary maps etc. This is a necessity if upper secondary school students shall be able to
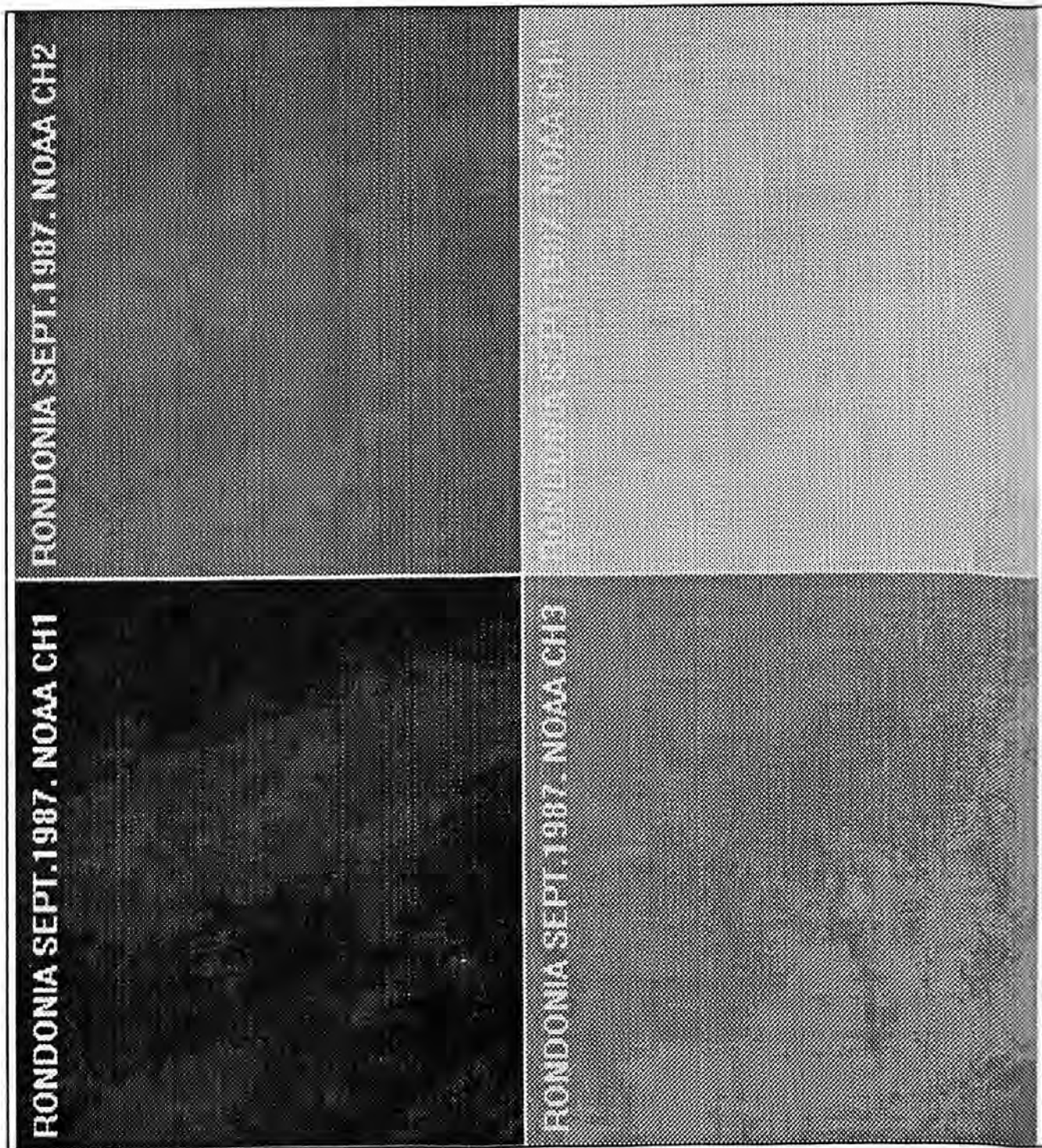
RONDONIA SEPT.1987. NOAA CH2

RONDONIA SEPT.1987. NOAA CH1

RONDONIA SEPT.1987. NOAA CH3
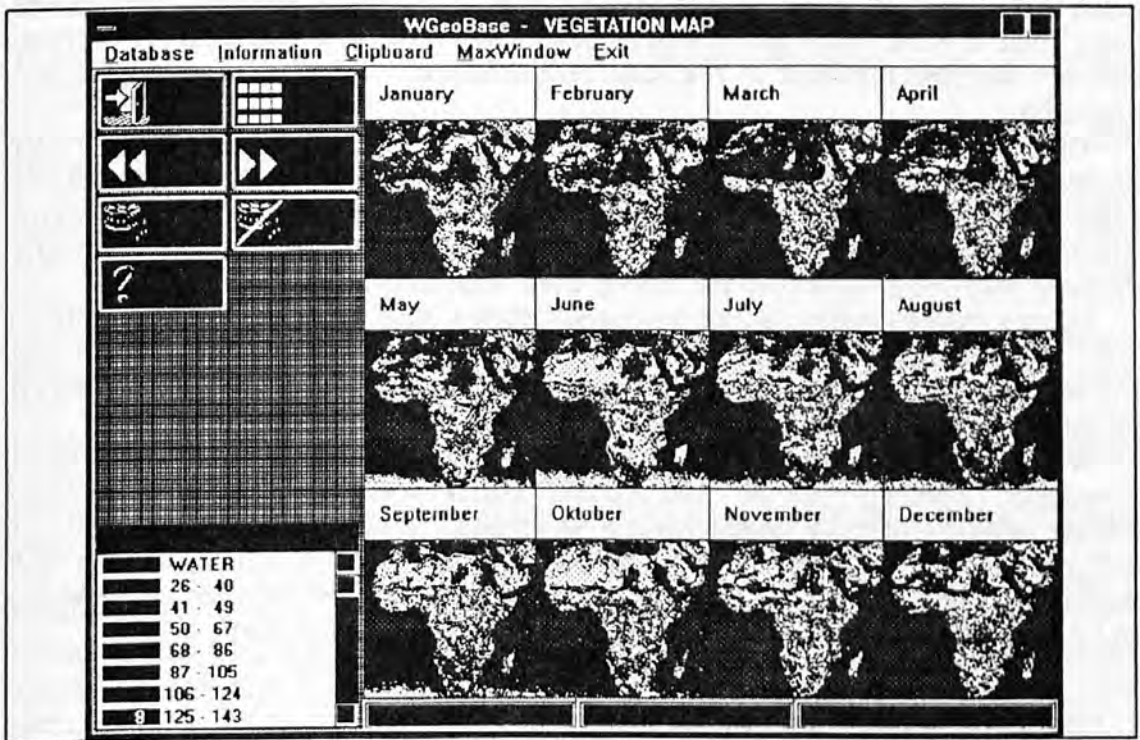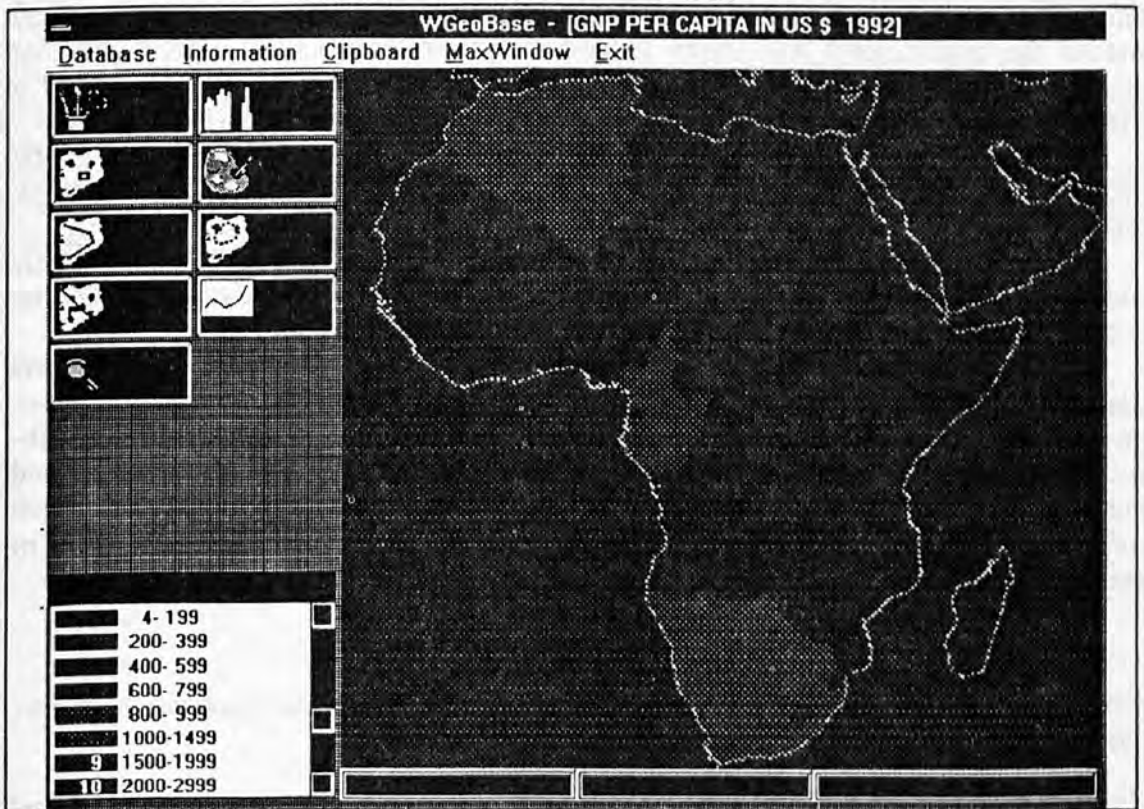
Figure 3

348

Figure 4

Figure 5

grasp more than the simple fact, that vegetation varies over areas and through the year. Thus, it needs thorough considerations to widen the user population. Nevertheless, a wider dissemination of NVI-data representations is both recommendable and promising.

The raw satellite image as well as the NVI representations above are raster images. All pixels represents information. The coastlines on the Africa images are based on vector files; i. e. they are based on information attached to the points, which are automatically connected by lines. The same applies to the following thematic maps represented on the screen from state info information.

Dataset representations on the screen sometimes have shortcomings according to e. g. accuracy or performance. Even in such cases computerized presentation and analysis may add valuable aspects or extra information to education primarily based on printed or other traditional sources.

We find it worthwhile to consider various databases according to a variety of viewpoints. Agencies such as CORINE and GRID would benefit from a comprehensive analysis of their georeferenced information in the light of assessments of existing and potential user populations and different sorts of communication and publishing. The same applies to services (e. g. foreseen on line information services) and educational activities (e. g. knowledge and technology transfer).

7. Interactive media, multimedia, and alike

Work with educational GIS among other things "... concerns the role of maps, which has always served a dual role as both a storage medium for geographic information and a presentation medium for conveying a specific spatial message. The need (and indeed the opportunity) has arisen to consider **representation** of information for storage and analytical purposes seperately from **presentation** of information as a visual artifact to convey a specific message" (Marble & Peuquet, 1993, 447)[12]. Derived questions and relations e. g. attached to symbols and language need to be addressed theoretically as well as in a practical educational context (Rudd ed. 1993, 84).

While we cannot produce a general conclusion of our tentative and heuristic didactic or didactically based methodological discussions we restrict a concluding remark to fasionable small talk leading to wishfull thinking.

Appropriate educational GIS is a powerfull interactive tool (just as chalk and blackboard). It is also an outstanding example of a multimedia approach[13]. Thus, educational GIS-packages together with appropriate information access may contribute decisively to sensible organized multimedia learning or information access and analysis environments. This article only considers basic elements of the process which may lead to educational support in a performance quality which until now more or less has been monopolized by entertainment and commercials.

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[12]This quotation also remind us about the many educational questions about representations (Lewin, 1936, e. g. 76-77 & 81-83) which are nearly omitted in this article.

[13]If the word multimedia means anything, it refers to the fact that information stored and transmitted in digital form are performed (presented) in different ways, such as text, graphics, maps, sound and video.

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GEO-TECHNOLOGY AND GEOGRAPHY TEACHING

Gary E. Miller, Donald Zeigler

Abstract

Computer technologies have the potential to revolutionize teaching, and geography has the potential to lead that revolution in social studies and science. New, user-friendly software such as CD-ROM, videodiscs, and electronic networks have given teachers and students the ability to interactively command a multitude of media—words, sounds, music, photographs, maps, charts, diagrams, drawings, data—in a quest to understand the world through a geographer's eyes. In the United States, the evolution of computer technologies has paralleled the national reform movement in education, a reform movement that has led to a renaissance in teaching geography, one of the "core subjects" in the National Education Goals. In an attempt to stimulate the diffusion of computers in education, the National Geographic Society and IBM, among others, sponsored two summer Educational Technology Leadership Institutes which, in turn, spawned several state-level institutes for teachers. In Virginia, these institutes came to be known as GeoTrek '93 and GeoTrek '94. One sample of student reactions to the use of computers confirms the promising applications of their use in the classrooms as projected by the federal government in its report entitled *Power On!*

Introduction:

Over the past decade, nationwide efforts to improve the quality of education in the United States have been led by the National Geographic Society (NGS), the National Council for Geographic Education (NCGE), the Association of American Geographers (AAG), and the American Geographical Society (AGS)—joined together in a coordinating body known as GENIP, the Geographic Education National Implementation Project.

This on-going geography renaissance first focused upon awareness, and then evolved into activism, teacher training, curriculum development, and finally the development of the National Geography Standards. A sequence of events in the geography renaissance, as applied to the classroom, is presented in Figure 1. A list of the documents which have sparked and guided this reform movement is provided below.

A Nation at Risk: Imperative for Educational Reform
by the National Commission on Excellence in Education
U.S. Department of Education (1983)
Emphasizes the dire need for educational reform in U.S. schools

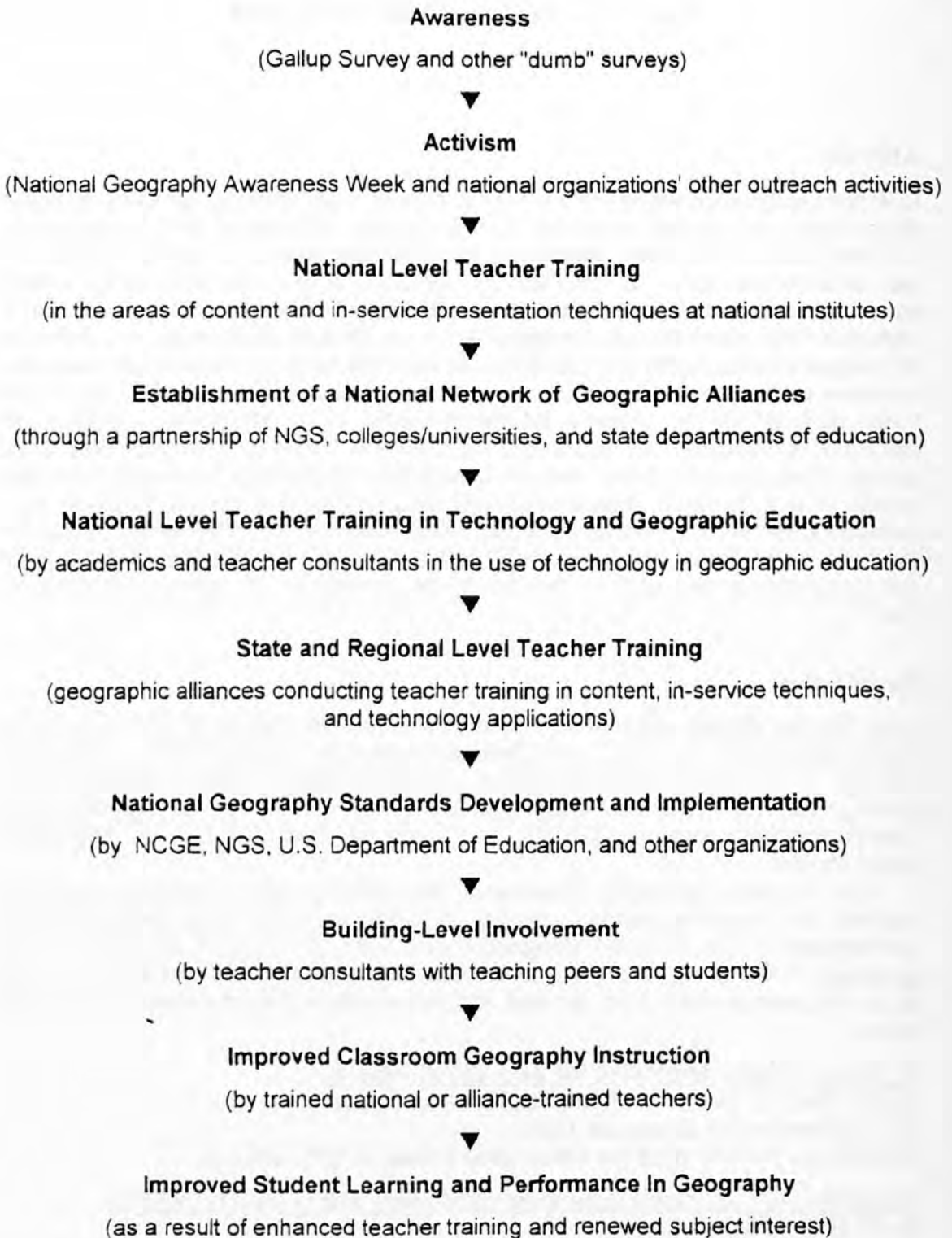Guidelines for Geographic Education: Elementary and Secondary Schools
by GENIP (1984)
Suggests a scope and sequence for geographic education

Figure 1: A GENERALIZED SEQUENCE OF THE U.S. GEOGRAPHY RENAISSANCE
AS APPLIED TO THE CLASSROOM

Awareness

(Gallup Survey and other "dumb" surveys)

▼

Activism

(National Geography Awareness Week and national organizations' other outreach activities)

▼

National Level Teacher Training

(in the areas of content and in-service presentation techniques at national institutes)

▼

Establishment of a National Network of Geographic Alliances

(through a partnership of NGS, colleges/universities, and state departments of education)

▼

National Level Teacher Training in Technology and Geographic Education

(by academics and teacher consultants in the use of technology in geographic education)

▼

State and Regional Level Teacher Training

(geographic alliances conducting teacher training in content, in-service techniques,
and technology applications)

▼

National Geography Standards Development and Implementation

(by NCGE, NGS, U.S. Department of Education, and other organizations)

▼

Building-Level Involvement

(by teacher consultants with teaching peers and students)

▼

Improved Classroom Geography Instruction

(by trained national or alliance-trained teachers)

▼

Improved Student Learning and Performance In Geography

(as a result of enhanced teacher training and renewed subject interest)

Geography: An International Survey
Conducted by the Gallup Organization (1988)
Publicizes the absence of basic geographic knowledge
among young Americans

What Work Requires of Schools: A SCANS Report for AMERICA 2000
Produced by the U. S. Department of Labor (1991)
Identifies geography and history as two of the
core subjects of the U.S. education system

Learning a Living: A Blueprint for High Performance
Produced by the U. S. Department of Labor (1992)
Provides recommendations for reorganizing
U. S. schools and educational assessment

Geography Assessment Framework for the
1994 National Assessment of Educational Progress
Developed under the direction of the
Council of Chief State School Officers (1992)
Promotes the application of geography in real-life situations
and as a link to interdisciplinary study

Raising Standards for American Education
Created by the
National Council on Education Standards and Testing (1992)
Recommends a performance based assessment system

Geography for Life: The National Geography Standards
Developed by the NCGE, NGS, U.S. Department of Education,
National Endowment for the Humanities (1994)
Establishes world-class standards for student performance in geography

Especially within the areas of teacher training and curriculum development, geographic education has begun to view computers and associated technologies as indispensable tools for teaching, much as the previous generation of educators viewed overhead projectors, audio and video tapes. The evolution of user-friendly computer technologies is going on at the same time as schools in the United States are undertaking the most significant reform in decades. In geography, these two trends have joined to complement one another.

Main Text

The National Context: Computers have become an increasingly important component of the school environment in the United States. By 1991, almost 98 percent of the elementary and secondary schools reported using microcomputers, as compared with 18.2 percent in 1981 (U.S. Department of Education, 1993, 433). Yet, despite their ubiquity, not even a majority of U.S. students are reported to be using computers in school, as illustrated in Table 1:

Table 1: Percentage of students using computers at school

	1984	1989
Pre-Kindergarten and Kindergarten	5.8%	14.7%
Grades 1-8	31.5%	52.3%
Grades 9-12	26.3%	38.7%

Source: U.S. Congress, 1988.0

What is striking is the rapid growth in the proportion of students using computers over the decade of the 1980s, particularly at the elementary level. What is also striking is the slow growth in computer usage among students at the secondary level, despite the pertinence of computers to employment in the U.S. economy, as illustrated in Table 2.

Table 2: Percentage of people using computers at work
According to level of education completed, 1986

Not a High School Graduate	7.3%
High School Graduate	27.9%
Some College	44.4%
Four-Year College Graduate	57.6%
More than Four Years of College	58.0%
Total	36.0%

Source: U.S. Congress, 1988.

The Uses of Computer Technology in School:
The federal Office of Technology Assessment examined the research record on the use of computers in the classrooms of the United States. They concluded that "there is no single 'best use' of technology in schools," but that "the varied capabilities of the technologies are the key to their power" (U.S. Congress, 1988, 11). Among the numerous promising applications of computer technologies are (U.S. Congress, 1988, 11-14):
– Drill and practice to master basic skills.
– Development of writing skills.
– Problem-solving.
– Understanding abstract mathematics and science concepts.
– Simulation in science, mathematics, and social studies.
– Manipulation of data.
– Acquisition of computer skills for general purposes, and for business and vocational training.
– Access and communication for traditionally un-served populations of students.

- Access and communication for teachers and students in remote locations.
- Cooperative learning via electronic networks.
- Management of classroom activities and record-keeping.

Computer-Aided Instruction and the Multi-Media Revolution:
Quantitative computations came first and word processing came second as applications of computers in the classroom environment. Now, the third wave of computer technologies is upon us. It is the advent of multimedia, or, more properly "a single medium that can deliver multiple data formats" (Bowers, 1994). The medium itself takes one of the following forms:

(1) **Diskette Application Programs**: Computer simulations, games, and data-manipulation programs may be purchased on 3 " or 5 " floppy disks. Floppies are flat pieces of flexible plastic on which information is stored magnetically. Often, these programs are loaded onto hard drives for quick application. Information may be read from and written to these disks. Examples:
> PC-Globe Maps N Facts
> Software Toolworks World Atlas
> SimCity and SimEarth
> Where in the World is Carmen San Diego?

(2) **CD-ROM**: Compact Disk—Read Only Memory. These 4-3/4" disks represent the same technology that has revolutionized the recording industry, the technology that has outmoded records and tapes in the high-fidelity reproduction of music and sound. On these disks, data is recorded digitally: 650 million characters on each disc, the equivalent of 200,000 pages of printed text (Bowers, 1994). Information may not be written to these disks. All of the above examples of diskette programs are also available on CD-ROM. Other examples:
> NGS World Atlas
> Microsoft EnCarta
> Microsoft Bookshelf
> Grolier Multimedia Encyclopedia

(3) **Laser Videodisc**: The laser disk is the CD-ROM's big brother, measuring about 12" in diameter. It has the capacity to store even larger quantities of pictorial information (more than 50,000 images per side) and motion sequences in addition to text and music. Like the CD-ROM, it uses laser optics rather than magnetic means to read data. Examples:
> GTV and STV (National Geographic Society)
> Our Environment (Optilearn)
> Hurricane Hugo (Turner Educational Enterprises)
> American and World History (Instructional Resources)

(4) **Telecomputing Networks**: Statewide, nationwide, and worldwide communication networks make it possible for teachers and students to talk to each other and exchange information despite the distances that separate them. Many provide opportunities to link with "The Internet." Examples:
> Prodigy
> America On-Line
> Compuserve
> VaPen (Virginia Professional Educators Network)

Of the above, both CD-ROMs and videodiscs give the user the ability to access individual frames or sequences in any order; hence, they are often called interactive computer technologies. Users can navigate their way around the software using menus, bar coded index numbers, remote control, videodisc player controls, or "hypercard" and related technologies. Although the personal computer user cannot write to them, CD-ROM information can often be downloaded to documents on hard drives and floppy disks.

It is the CD-ROM and the videodisc that have made possible the development of multi-media teaching and learning in the classroom, simply because all forms of information can be stored and randomly accessed on a single disk: text, large data bases, maps, photographs, graphs, videosequences, and all types of sound. This is what makes them so useful for geography instruction.

Geography and the Multi-Media Revolution:
Geography certainly benefitted from the computational and word processing capabilities of the personal computer revolution, but so did most other disciplines. With the advent of multi-media computer resources, however, geography has the opportunity to exploit its comparative advantage as a field of study where visuals (and "audials") provide the raw material for learning. In fact, geography has been at the forefront of the multi-media revolution, and many of the commercially available products contain large quantities of geographic information, particularly maps and pictures. Multi-media makes it possible to assemble the sights and sounds of the word at a student's fingertips. Yet, the best may still lay ahead of us, as the fourth wave of computer technologies, virtual reality, makes geography instruction come even more alive. The list in Figure 2 provides a comparison of the traditional and computer-aided methods that teachers may use in the geography classroom.

Diffusion of Multi-Media Geo-Technologies:
The National Geographic Society, in cooperation with a consortium of private corporations and local school systems, has been a leader in training teachers to use diskette software, CD-ROM and videodisc technologies in the classroom. When NGS realized that the computer technologies of the 1990s were becoming an increasingly important factor in geography teaching, they took the lead in fashioning national summer teacher institutes, known by the name of ETLI—Educational Technology Leadership Institute. The first ETLI was held in 1991, the second in 1992. The teachers who participated in these institutes returned to their home states armed with know-ledge, skills, hardware and software. As Teacher Consultants, their task was to make their knowledge available to their peers and stimulate the diffusion of interest in using computers in the geography classrooms of the United States. By May 1993, 64 teachers from 29 Geographic Alliances, had conducted 589 workshops, and affected 19,200 educators.

Figure 2: Tools and materials in geographic education

Traditional Geographic Education Tools and Materials	Contemporary Technology-oriented Geographic Education Tools and Materials
- notebooks and pens/pencils - chalkboard and chalk - mimeographic or Xerographic reproduction - text - publishers' workbook activities, graphs, charts, tables, and maps - atlases - globes - almanacs - wall maps - audio tapes - video tapes - filmstrips - 16mm films - overhead projector and transparencies - TV broadcasts - posters-slides and photos - teacher-made materials - artifacts - guest speakers/presenters - coaxial or phone line classroom connections	- multimedia computer station - multimedia computer network - hard or floppy drive-generated programs and data - CD-ROM - Laserdisc - floppy diskettes - bar-code readers - interactive software - Liquid Crystal Display Panels (for overhead projection) - VGA to TV converter software and hardware - fiber optic classroom connections - modem - telecomputing - word processing - distance learning

During the summer of 1993, mini-ETLIs were conducted in the states of Virginia, Texas, Hawaii, and Utah. In Virginia, the institute was taught as a 3-credit graduate course for teachers, social studies supervisors, and teacher-training candidates. It came to be known as GeoTrek '93. It was a collaborative venture between the Virginia Geographic Alliance (the state arm of the National Geographic Society's Geography Education Program), Old Dominion University, WHRO-TV (the local public television station), and a consortium of schools in the Hampton Roads area. Teachers were provided with content and methods: there were formal lectures on the various sub-fields of geography, instruction on using computer hardware and software, laboratory time for practice, and an expectation that teachers would develop a unit of work for their own classrooms. Teachers were also expected to stimulate the adoption of computer-assisted methods of teaching in their home schools, a continuation of the ETLI "teachers teaching teachers" model. It was followed this year by GeoTrek '94. Both institutes were held off-campus at a conference center on the Chesapeake Bay, and they lasted a full week.

Perspectives on Computer-Aided Learning in Geography:
According to Dr. R. C. Lear, education consultant, students generally have the following retention values twenty-four hours after a learning experience:

11% of what they hear
30% of what they see and hear
50% of what they see, hear and do
90% of what they explain back to the teacher (or others)

The use of multimedia technology can provide an opportunity for students to hear, see, do and explain the content, concepts, or skills facilitated by the teacher. It can also allow for students to achieve at their pace, moving ahead or seeking remediation. Further, it provides an opportunity for to seek learning through an avenue that matches their innate learning style. According to Hanson, Silver, Strong and Associates, Inc., students have specific learning styles which reflect specific personal characteristics of internalizing and processing information. People learn through sensing, thinking, feeling, and intuition. This develops into a questioning strategy of (1) Mastery (who, what, when, where?) or remember/recall, (2) Understanding (why and how?) or reason, (3) Involvement (who and why?) or relate, and (4) Synthesis (what if?) or reorganization. Insofar as teachers are able to capture the capabilities of computers to cater to different learning styles and foster higher-level learning, they will be successful.

So far, however, the perspectives on the value of computers in the classroom have been ours. To supplement those views, we have provided the following assessment information: quotations from students who have been using computers in their geography class during the past year at Frank W. Cox High School in Virginia Beach. Students represent a mixture of ethnic backgrounds, socio-economic classes, and academic achievements.

Students were asked the following questions in an open-discussion format. Then, they were instructed to write their responses to the questions and hand them in:

How do you feel computer technologies affect your learning processes? If there is any affect, could you relate how using the computer has affected you positively or negatively.

We analyzed responses in an effort to define themes in student perceptions of computers. We present quotations from their responses below, organized under twelve major topics. Each theme represents a generalization that students seem to be making about their experience with computers.

1. Computers will never replace teachers.
". . . they are aides and should never take place of a knowledgeable trained teacher who can field specific questions and provide individual help."
". . . teachers will always be needed in the classroom, not only to pass on their knowledge, but to serve as role models and to encourage the next generation."

2. Computers assist visual learning and cater to multiple learning styles.
". . . The visuals are better than a book because you found them. You're the one who got it on the screen."
". . . If you can see the subject of what you're talking about, it tends to hit home a little harder."
". . . sometimes when I'm taking a test and forget things, and in my mind I can "see" the computer screen for the answer, or hear the entire electronic voice over

and over in my head."

". . . I'm the type of learner who has to see it, write it, and read it to apply it and make sense of it."

3. Computers make learning more fun.

". . . we need a new way to learn things, a way to keep us interested and enthused about our studies, computers can give us that."

". . . You even make it into a game form. Even for a test."

". . . It's faster, easier, more interesting, and better for me."

4. Computers give students control over the learning process.

". . . allow students to take learning into their own hands so they could carry on this information in the future and actually use it instead of looking through boring books."

". . . I think that having control, and seeing pictures enhances my learning. I get more out of pictures than words. Words are the same, black and white. Pictures are from real life with many colors."

". . . computers use graphics and images to help us instead of words. Those images in your mind stay there longer than words. . . you can control it. Instead of turning pages you can just click a mouse button."

5. Computers prepare students for the future.

"Computers require our attention, unlike a book, they require more than the turn of a page to change the screen, forcing us to learn computer skills (which we will later need in the job market)."

6. Computers centralize the learning environment

". . . We could save notes, outlines, maps, etc. on the discs instead of carrying around notebooks and such."

7. Computers make you think more.

". . . Makes you think more. Takes a hands-on approach."

8. Computers make learning more efficient.

"Technology is easier to learn on than books. It is twice as fast, plus you learn more because it is fun."

". . . By using computers, not only will things get done more quickly and efficiently, we will also improve our computer skills."

". . . It's faster and more accurate. Basically, it's easier. Less room for mistakes and your final product looks better."

". . . there's no hassle to it, if you have the correct skills to learning through a computer."

9. Computers allow student to achieve perfection in the final product and build self-esteem.

". . . Computers make your reports, notes, and other papers nicer looking and capable of reading."

". . . It's also a lot neater, and work is a lot quicker and more polished looking. Another plus is that basically everything you need to do most everything you want including encyclopedias."

10. Computers allow students to set their own pace.

". . . we can learn what we want when we want and at our own pace instead

of a teacher standing in front of us teaching."

". . . Computers enhanced my learning processes a great deal by quicker response to questions, and they focus only on you and not 30 other people. Computers are kinda your own teacher, for classes or one certain subject."

Discussion

The student quotations related above match nicely the "promising applications of computer technologies" as identified by the federal government in the 1980s. Despite the strong, positive effects of ETLI and the state-level institutes devoted to producing computer-literate teachers who can incorporate the newest technologies into their classrooms, barriers to diffusion still exist. Specifically, even teachers who have been through these summer institutes report returning to school with insufficient hardware resources, inadequate work space, no funds to purchase software, and school administrators who are less than supportive of such high-cost ventures. Yet, computers also seem to give us the opportunity to break the barriers of geography that separate us, to put classrooms around the world in instant contact with each other, and to build the global village out of chips rather than bricks. They offer to bring the world to the classroom through multimedia audio and video experiences that can be managed by students and teachers alike. They support a wide range of teaching activities: lecture, class-wide discussion, panel discussions, independent work, small/large group work, competitive games, audio-visual presentations, worksheets, desk/research station activities, and oral presentations. They permit teachers not only to tell students, but to show them, to demonstrate processes and to provide guided practice. They allow students to manipulate data and designs independently and to explain their learning to others. They also allow students to learn at their own pace and in their own way. Yet, we should not come to see the computer as a substitute to teachers, but as part of the learning environment which teachers must learn to master.

Conclusion

Computer-associated technology allows for teachers and students to more easily gather, organize, and integrate the already immense, but relentlessly expanding, body of information available for learning. At the same time, it appears to address students' multiple learning styles and can, when properly applied, allow students to develop consistently higher order thinking skills and engage in problem-solving. In this regard, it is ideal for use in the study of geography. The spatial and ecological nature of geography can be more easily exploited by students and teachers through the manipulation of digital maps, data, and diagrams. Research and accompanying analysis, synthesis, or evaluative tasks can also be accomplished more efficiently. As computer skills are being required by more employers and as college and universities increase their computer expectations of in-coming students, even more pressure will descend on the schools of the United States to produce succeeding generations of computer literate graduates.

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3.0 RESEARCH THEORIES AND METHODS IN GEOGRAPHY EDUCATION

THE ROLE OF QUALITATIVE RESEARCH
IN
GEOGRAPHICAL EDUCATION

Rod Gerber

Abstract

The artistry of qualitative research comes from a comprehensive understanding of research methods in general and a variety of specific qualitative methods in particular. Instrumental in this artistry is a thorough understanding of the sources of qualitative research, especially the anthropological ones and the hermeneutic ones. Doing qualitative research in geographical education is as rigorous a process as it is for any other approach to educational research. In fact, it could be argued that doing qualitative research is a more lengthy and time-consuming process because it involves a careful checking for soundness and consistency at each step in the research process. This paper demonstrates the nature of the qualitative research process by focussing on the following aspects: the choice of a research method in geographical education; an overview of the historical roots of qualitative research; a consideration of which research questions to investigate in geographical education using qualitative research methods; approaches to use when gathering qualitative data; approaches to follow in doing qualitative data analyses; and issues to consider when reflecting on the soundness and consistency of the particular qualitative research study.

Choosing a Research Method for use in Geographical Education

The choice of a research method in geographical education should not be based on the fact that the researcher knows one research method better than any other. Neither should it be based on researcher's perception that previous studies into an aspect of geographical education have all used a particular kind of research method and so this pattern must be maintained. Rather, the researcher should be conversant with a range of research methods, and having conceptualised the research study, he or she should be confident to use the one method that suits the conceptualised study the best.

The geographical education researcher needs to understand a number of aspects of research methodology before he or she is able to make confident choices in this regard. Firstly, the researcher needs to adopt a "house of science" approach research methods. This approach, detailed by the author (Gerber, 1993a:40) elsewhere, follows the continental European tradition that states that each research method is like a house with three floors - the ground floor consists of the philosophy that underpins the research approach; the first floor consists of the many and varied applications of this method that have been completed and disseminated; and the top floor consists of the metatheory that explains the actual research method. Secondly, the researcher should decide whether he or she wishes to adopt a dualistic or a non-dualistic

approach to the research problem. A dualistic approach adopts the traditional Cartesian view that it is possible to separate theoretical aspects from practical ones (Markova, 1982), aspects of the mind from the mind in which experiences occur, and the subject from the object in any research study. A non-dualistic approach, as described by Marton (1993:3-4); Rogoff (in press) and Vygotsky (1978) opposes such a view by declaring that the object of the research (the problem) and the subject (e.g. the learner) are not separate. As Marton (1993:4) concludes "an experience is a relationship between object and subject and encompasses both. The experience is as much an aspect of the object as it is of the subject." Thirdly, the researcher must decide whether the research problem deals with a phenomenon that is well understood or one that is somewhat poorly understood. If the phenomenon of the research is well understood, e.g. the researcher decides that it is accepted amongst geographical educators what weather is, then it is probable that the research into children understanding weather should be conducted using an experimental design. Alternatively, if it is decided that the phenomenon of weather is not well understood by geographical educators and learners then the researcher should choose some form of qualitative research.

A point that will be presented throughout this presentation is that this researcher is convinced that many phenomenona in geographical education, even those that one would normally expect geographical educators to understand and agree to, e.g. the concepts of geography, river, mountain, map and population density, and variously understood. Consequently, it may be argued that all of these concepts and related phenomena are fair game for studies that use different qualitative research methods.

Which qualitative research methods might geographical educators consider for their investigations? Tesch (1990:21-72), in her overview of the field of qualitative research, concludes that four types of qualitative research may be discerned:

1. Research that studies the characteristics of language, e.g. content analysis or discourse analysis;
2. Research that aims at the discovery of regularities, grounded theory or naturalistic inquiry;
3. Research that seeks to discern meaning, e.g. phenomenology or case study; and
4. Research that is based on reflection, heuristic research or educational connoisseurship.

It is a challenge for geographical educators who are interested in research to consult a wide range of publications that outline the nature of these types of qualitative research in order to appreciate the three floors for each "House". Such a process is a relatively slow one that often involves considerable interaction with other qualitative researchers through collaborative experiences such as conferences, research projects, scholarly writing tasks and personal communication. Some experimentation with particular research methods may be necessary to enable geographical educators to understand fully the strengths and weaknesses of specific approaches.

Historical Roots of Qualitative Research

The historical roots of qualitative research methods are varied and need to be considered by geographical educators if they are to understand fully the philosophy of different families of these research methods. Basically, these roots emanate from two sources - the anthropological tradition that was developed in the USA and in the United Kingdom, and the hermeneutic tradition that has developed over centuries in

continental Europe. Both of these sources provide the action of interpretation as the main form of analysis of qualitative data.

The anthropological tradition that was developed especially in ethnographic research provided the method for investigating social questions and human experience through careful observations and the collection of a wide range of data. This strongly sociological approach was popularised by the Chicago school of researchers, e.g.Perry (1968) in his urban research in Chicago. It is also presented as a basis for the more recent ethnomethodology, e.g. Garfinkel (1967) and grounded theory (e.g. Glaser & Strauss,(1967) and Corbin & Strauss (1990)) methods of research.

The hermeneutic tradition of research which was derived from interpretive studies of religious scripture has developed most strongly in the school of phenomenology which is now characterised by two main streams - transcendental phenomenology (e.g. Husserl) and existential phenomenology (e.g. Heidegger) (See Spinelli, 1989, for a concise summary of these differences). A range of variations have been developed within these two streams in differing cultural and educational contexts. The Frankfurt school developed by theorists such as Habermas and Apel injected a more socially-critical approach to the research. In Sweden, the approach known as phenomeno-graphy was developed by educational researchers in Gothenburg as an empirical approach that considered collective data rather individual data in a relational non-dualistic manner. Post-modern theorists such as Foucault, Friere and Giroux have adopted more pragmatic, reconstructionist approaches to their qualitative research.

A possible bridge is being developed across these two traditions by the social and educational researchers who study aspects of cognition in everyday living. These researchers, e.g. Cole, Scribner, Lave, Saljo and Rogoff, have drawn aspects of cultural mediation and discourse analysis from the anthropological tradition and phenomenological principles and non-dualistic orientations from the hermeneutic tradition to develop their situated cognitive approach aptly termed a sociocultural approach to qualitative research. In addition, they place emphasis on the activity theories as developed by Russian psychologists such as Vygotsky and Leontiev.

This historical sketch of qualitative research methods helps to offer educational researchers some guidance in identifying the philosophies that form the ground floor in each of the qualitative research methods. The anthropological roots of such research methods as ethnography, grounded theory and ethnomethodology offer quite different sources to those of the different hermeneutic and phenomenological methods, and similarly both vary in regard to the situated cognitive sociocultural approaches.

Once the differences in the historical roots of these qualitative research methods are appreciated, then geographical educators will have less difficulty in understanding the different strengths and weaknesses of these methods when applied to different research problems.

Which Research Questions for doing Qualitative Research in Geographical Education?

Interpretation is an essential element of these research studies. Antagonists of qualitative research believe that the element of subjectivity is the one that weakens any of the above-mentioned types of research. However, as will be demonstrated later in this document, this perceived "weakness" can be made quite powerful if the appropriate phenomenological principles are adhered to during the research process.

The challenge for interpretive researchers is to conduct research studies in the knowledge that the reality that is perceived by participants in the research process is constantly changing because of the dynamic nature of our experience of phenomena. People may experience a particular phenomenon in a different set of contexts, e.g. finding one's way in familiar territory, in a foreign country, at night or after the staff Christmas party. The wayfinding experience is likely to be different in some of these contexts. It is the challenge for interpretive researchers to accept these variations in experience and to place them in their relative contexts. Therefore, it may be concluded that reality is context-based.

What is important for researchers is the search for alternative constructions of reality that are open to many possible explanations for observed phenomena, few of which can be ruled out in advance of the study. Therefore, interpretive researchers are opportunistic as they investigate complex issues or problems about which little is known with certainty.

It is the growing lack of certainty in people's knowledge of specific phenomena that has encouraged interpretive researchers to expand their investigations. For example, it has been assumed that everyone in the fields of geographical and environmental education were meaning similar things when they used either of these two fundamental terms. Studies by the author in the area of geographical education (Gerber, 1991 and in press) indicate that this is not the case and that four or five qualitatively different variations are held by training geography teachers. It is suspected from anecdotal evidence gained in the compilation of the **International Charter on Geographical Education** that these variations are widely held amongst geographical educators around the world. Similar studies need to be completed in the area of environmental education since it likely that similar variations exist for these educators.

It follows then that the research questions that should be asked by interpretive researchers are open-ended ones that capture either the essence or the variation of the experience of relevant phenomena in geographical and environmental education. As will be shown later, the focus on the essence of, or the variation in, the experience will depend on the research method used, e.g. the essence of an experience may be derived from a strictly phenomenographic study whereas the qualitatively different variations will be derived from a phenomenographic study.

The open-ended nature of a good research question can be demonstrated by considering a phenomenon as apparently straight-forward as **Geography**. The choice of the research question depends on the purpose of the research study. If the purpose of the study was to determine teachers' understandings of the phenomenon of Geography, then a research question should be framed to capture the intent of the study. If the question aims to capture the teachers' experience of Geography as the basis for their understanding of the concept, then it is necessary for the researchers to frame a non-technical question that may be used to elicit the teachers' experiences of Geography. Some suggestions for an appropriate research question on this topic include the following:

1. What are teachers' experiences of Geography?
2. How do teachers understand Geography?
3. How do teachers use Geography in their teaching?

In a broader context, it is possible to illustrate some different types of research studies that may be designed, implemented and analysed by interpretive researchers in the areas of geographical and environmental education. They include:

1. Studies of students' and teachers' conceptions of different geographical and environmental concepts.

Geography and environmental studies have their own sets of technical terms, i.e. their distinctive concepts such as spatial distribution and environmental competence. Dictionaries and textbooks inform both educators and students what these concepts mean. However, since the meaning of these concepts actually reside in the minds of the learners or the educators, it is highly likely that people's understandings of both of these concepts will vary from the textbook definitions and they may vary according to the learning context. Investigations into the nature of the discipline of Geography (Gerber, 1991) and Geographical Information Systems (Gerber, Buzer, Worth & Bruce, 1992) are indicative of such research. Variations in experienced meaning of the same concept are likely to occur across the different learning contexts that are evident in different countries where there are varying cultural aspects and linguistic variations, and within a specific educational context.

2. Studies of the essence of people's experience of geographical and environmental phenomena.

If researchers want to develop an experience-based interpretation of selected phenomena, it would be desirable for them to investigate people's experience of each phenomenon and to deduce the essential general attributes of each one. One phenomenon common to geographical and environmental education is fieldwork. What is the essence of the fieldwork experience? Despite the apparently numerous studies that have been conducted about the phenomenon of fieldwork it is unlikely that any experientially-based studies have been conducted to establish what these essential general attributes are. Similarly, these attributes have not been determined in distinctive contexts such as schools, universities, field study centres or in homes.

3. Investigations of learning in Geography.

What do people learn about some aspect of geographical or environmental education or how do they learn this information? It is quite possible to obtain a set of categories of description of people's experience for each learning context. Knowing what a junior high school Geography class understands by the use of common terms such as weather and climate is likely to provide a number of insights into the nature of the learners that may offer guidance for the selection of content, the range of resources and the sequence of learning to be undertaken in a study of weather and climate. While these outcomes will be interesting in their own right, they are likely to offer greater richness if they are placed in a specific educational context.

In phenomenographic studies of learning, close attention is given to searching for the qualitatively different conceptions held by students as they undergo learning experiences. In addition, there is a consideration of the learners' knowing that they are making these different statements. For example, if a geography teacher wants to know whether his or her students have learned the concept of weather, it is quite feasible for the teacher to present his or her students with a writing task before studying weather in which a well-designed non-technical question is framed and the students are required to complete the task, preferably in a written form. The students are required to complete a similar or the same task upon completion of the curricular unit. An analysis of the two sets of conceptions will reveal the extent to which any qualitative changes have occurred in the students' understanding of the concept of weather. Such an outcome may be confirmed by discussing with the students the

extent to which they appreciate the different conceptions of weather that they have exhibited.

4. Studies of people's reflections and rememberings of specific phenomena.
Instead of engaging in protracted longitudinal studies of learning or curricular change in geographical and environmental education, interpretive researchers may implement investigations that require people to reflect on their practices and to remember their intentional actions during these events. Remembering their roles in the implementing of a humanities curriculum (Gerber, 1993b), considering the development of the concept of planning (Rogoff, Baker-Sennett & Matusov, 1993) and exploring responses to local composting activities in waste management (Shanahan & Saljo, 1993) offer some suggestions for interpretive researchers to follow. The quality of such studies will depend on the extent to which the researchers are faithful to the philosophies that underpin their selected research methods.

5. Studies of how learners develop meaning of geographical and environmental concepts in different educational contexts.
Following Svensson's (1985) lead, contextual analyses in regard to selected aspects of geography or environmental studies could provide a basis for powerful research investigations. These may lead to generalisations about understanding selected phenomena ranging from domain aspects such as drainage basins, climatic change, urban areas or desertification, and to pedagogic aspects such as hazard risk reduction education, fieldwork learning through simulation or virtual worlds. Such investigations are likely to offer fruitful ways for investigating how students develop their conceptions of the above-mentioned phenomena and for unravelling how the particular learning context assists or hinders the learning process. It would be interesting to find out how students learning their geography by open access methods may develop different understandings of specific geographical concepts to those developed by students learning via face-to-face methods.

6. The use of discourse in the learning process in geography and environmental studies.
Studies into the use of discourse in the learning process in geography and environmental studies may also be illuminating. Instead of seeking to define and describe learning in geography and environmental studies in a 'neutral' sense, this type of study focuses on the exploration of the intertextuality between discourses in learning geography and environmental studies to show how the learning is construed by the students and the teachers. Conceptions of learning are culturally based, but the dominant investigation of them from traditional scientific discourse tends to hide these differences. Learning can therefore be considered in terms of human activity and shared experiences in a complex world rather than being described in terms of cognitive processes. This is a very different way of considering how students learn about industrialisation in different developing and developed countries. Such studies offer the chance to incorporate aspects of language and culture into learning specific concepts in differently defined contexts in geography and environmental studies.

Gathering Qualitative Data in Geographical Education Research

Since qualitative researchers often collect data of people's experience of certain phenomena they normally engage in some form of discourse with a range of people in a designated social context. Since the social context in which the experience occurs is the basis for the mediation of the meaning of the participants' memory of the experience of the phenomenon, the data gathered in a reflective process cannot be 'single-minded' (Middleton and Edwards, 1990), i.e. it does not emanate only from the minds of the participants to the experience. Rather, it is a 'dialogical' experience (Markova and Foppa, 1990) in which the discourse is established amongst the researchers and the participants to develop shared meanings of the participants' experience of the phenomenon. For example, if the object of the research was to understand how community members found their way around an environment the data derived from such a study would consist of the shared meanings of the participants' experience of a range of different behaviours and experiences that have been accumulated though finding their way which emerged in different types of discourse with the researchers.

Therefore, the act of reflection is a joint process in which the researchers work with the participants to reconstruct their experience of the specific phenomenon, i.e. their conception of wayfinding. The researchers seek to elicit from each participant their fullest recollection of their experience of wayfinding. They will usually do so in interviews by: asking leading questions, making suggestions, structuring responses, asking for descriptions of particularly challenging experiences, probing for fullest understanding, seeking themes, seeking clarifications and placing comments in perspective (Kvale, 1983). In addition, data may be acquired by asking the participants to express their views about wayfinding in graphic forms such as drawings, diagrams and maps. Alternatively, their behaviour during the actual experience of wayfinding may be recorded, e.g. by videotaping or by completing a behaviour matrix. This will enable the researchers to capture the range of responses by the participants to their actual and remembered experience of the act of wayfinding.

Phenomenological principles such as reduction, internal and external horizon, essence and intentionality are used to gather relevant data. It is the task of the researcher to bracket his or her views about the phenomenon under investigation in order to obtain the fullest account of the participants' experience of landscape. Jonsson, Linell and Saljo (1991:5) state, therefore, that this process reflects a dialogical one in which several voices are entered and where an institutionalised social practice organises discourse and reflection.

Marton (1992) further emphasises that the prime form of data-gathering consists of the interview which aims to make that which is unthematised into the object of focal awareness. Therefore, the researcher should not make up too many questions in advance nor should s/he determine too many details in advance of the actual interview. This is to ensure that the interview is the joint exploration of the actual experience of the phenomenon. Its starting point is usually a non-technical question that introduces the phenomenon. This question is usually introduced after the participants have been exposed to an experience of the phenomenon, e.g. they have participated in a wayfinding activity. The non-technical nature of the question is intended as the catalyst for commencing the dialogue. In the case of the current example of the experience of wayfinding, this question may take the form of: "Please

tell me how you found your way around the area?" after a preliminary introductory discussion between the researcher and the participant. Alternatively, the researcher may commence with the question: " Can you tell me something interesting about finding your way around this area?" if there has not been time for a preliminary discussion about the phenomenon.

Researchers such as Miles and Huberman (1984) have argued that the preliminary analysis of data should proceed concurrently with the collection of the data. Sowden and Keeves (1990: 654) propose the following reasons for doing this:

1. There is a danger in the collection of a huge amount of qualitative data that the analysis will become such a daunting task that it will jeopardise the completion of the study.
2. Concurrent analyses will identify gaps in the data and new hypotheses and relationships emerge while it is still possible to collect relevant data.
3. Ongoing analyses permit the preparation of an interim report that is reassuring for the client and facilitates the flow of funding for the study.

Consequently, they urge all qualitative researchers to maintain detailed documentary records of the data collected.

Doing Qualitative Analyses in Geographical Education Research

Once the data are organised in a digestible form they can be analysed. Sowden and Keeves (1990:654-5) declare that the analysis of qualitative data passes through the following interrelated stages:

1. data reduction where the primary task is to code the data;
2. data display in the form of a matrix so that patterns are evident in a form that can be used in the presentation of results; and
3. conclusion drawing and verification to establish whether the conclusion is soundly drawn from the evidence available.

They detail a variety of tactics for deriving meaning in qualitative analyses. These include:

1. Counting the number of instances that an event or a relationship occurs, e.g. the number of times that students refer to a catchment in a study of water quality.
2. Noting patterns and themes, e.g. the regularities in students' perceptions of deserts as hot,dry places or the essential attributes of learning to use maps.
3. Imputing plausibility, e.g. checking back on the data to confirm that the general attributes of environmental interpretation as expressed by a selected group of visitors to an environmental theme park are acceptable.
4. Clustering events, actions, beliefs or values into groups, e.g. in a study of urban land use to group all of the responses that relate to business activities as opposed to those that are related to residential activities.
5. Using metaphors to detect new and different perspectives of a phenomenon, e.g. seeing the actions of tactile mappers as those of lateral thinkers who maximise the environment through sound and touch.
6. Developing categories to organise the data into like cases, e.g. the development of conceptions and subconceptions of learning the concept of region.
7. The compositing of factors and categories to form more generalised and meaningful relationships, e.g. the essential attributes of the experience of landscape or the general attributes of an ecosystem.
8. Noting relationships amongst the data to systematise the search process, e.g. noting

the relationship between the adoption of waste recycling methods and media advertising in a waste management study.

9. Detecting mediating factors in the social context of the research experience, e.g. a community's attitude to public transport in a study of transportation in an urban area.
10. Building a logical chain of evidence to explain people's behaviour, e.g. linking the attitudes of people to parklands to current government policy on the use of park land area and the patterns of usage of local parklands.
11. Constructing a causal chain to involve a temporal sequence of events, e.g. establishing that students' inability to orienteer through a forest occurred because they were unable to use a compass and an orienteering map, as well as their continuous display of a poor sense of direction.

The above list is useful, but it does not indicate the intensive iterations that occur during the qualitative analytical process. The process of reading and rereading the verbatim transcripts and other forms of discourse involves the researchers participating in a process of clarification of the data in which the meaning of the experiences emerge from the data. Essentially what the researchers are seeking are similarities or differences in the experience of the particular phenomenon.

Studies which are seeking similarities or essences are phenomenological studies that use differing forms of analyses all of which adhere to either transcendental principles as proposed by Husserl or existential principles as proposed by Heidegger. Phenomenological analytical methods such as those by Giorgi (1986), Idhe (1986) and van Manen (1990) are indicative of the more widely used Husserlian approach to the study of phenomena. Each of these theorists offer techniques for the thematising of data to extract the essence of people's experience of a phenomenon. For example, Giorgi (1985) details the five steps of his phenomenological psychological method as extending from the reading of the entire description of one subject to obtain a sense of the whole through to the expression of a typology of concepts of the phenomenon. This typology represents the essence of the experience of the phenomenon. For example, the data from a study on learning geography through simulated experiences may be analysed in this way to thematise the nature of this experience.

Those studies that seek to detect the variations in people's experience of selected phenomena usually involve phenomenographic analyses which Marton and Saljo (1984) describe as a nonalgorithmic, interpretive "discovery procedure". Whereas phenomenological studies normally deal with individual responses for analyses, phenomenographic studies deal with collective data. Marton (1992:9) says that this is because the same participant may express more than one way of understanding the phenomenon. Since the data is dealt with en masse it usually consists of a large body of transcripts. Marton goes on to describe the method for reducing this mass of data and to introduce meaning into the variations in the participants' experience of the phenomenon. The following steps are involved:

1. Selection of the relevant from the irrelevant data in relation to the selected phenomenon.
2. Identification and grouping of the distinct ways of understanding the phenomenon by commencing to thematise the reported experiences.
3. Establishment of the relations between the groups of conceptions, i.e. the features of the categories of description that characterise the variations in how the phenomenon is experienced, conceptualised or understood.
4. Determination of the logical relations that exist between the categories of

description. This is expressed as an outcome space which is a graphic that explains the extent of linkages amongst the categories of description.

As Marton (1992:10) stresses, the different steps in phenomenographic analysis should occur interactively because each step has implications for succeeding as well as the preceding steps. He emphasises that once categories of description and the outcome space have be found "they can be reapplied to the data from which they originate". Since each set of conceptions is contextually-bound it is only possible to make conceptual generalisations about the data rather than statistical generalisations.

When the phenomenographic type of analysis was applied to people's conceptions of a Geographical Information System (Gerber, Buzer, Worth & Bruce, 1992), after three or four iterations of reading the data and discussing the different experiences the researchers discovered that the group of GIS professionals and academics agreed that five variations were evident. These were:

1. GIS is experienced as a graphics interface.
2. GIS is experienced as a geographical data organiser.
3. GIS is experienced as data collection representation.
4. GIS is experienced as the process of interaction between an expert in geographical information and extensive data sets to solve geographical problems.
5. GIS is experienced as an evolving spatial technology.

The resulting outcome space revealed that conceptions 1 and 2 focus on independent aspects of the GIS - the database in conception 1 and the graphics interface in conception 2. Conception 3 focuses on both aspects. Conceptions 4 and 5 represent interest in GIS that goes beyond conception 3 to emphasise expert users of GIS and the possibilities that they see in using GIS technology for solving geographical problems.

Some recent qualitative approaches to research have placed greater emphasis on the context that mediates the meaning of the data gathered and on the nature of the discourse used to gather the data. These approaches, typified by the socio-cultural approach, do not focus only on similarities or differences that are grounded in phenomenological principles. Rather they are underpinned by activity theorists such as Leontiev (1981) and Vygotsky (1978) and their studies focus on cognition in everyday learning. Examples of this type of research include problem-solving and situated reasoning (Saljo & Wyndhamn, 1990), the concept of planning (Rogoff, Baker-Sennett & Matusov, 1993) and the analysis of developmental processes (Rogoff, Radziszewska & Masiello, 1993). Analyses, here, take the form of incisive interpretations that use quantitative and qualitative data to illuminate how the context of the experience mediates the meaning of the actual experience and the discourses that are used to reflect on the everyday experience. Any of these topics could be used in the interpretation of the use of geography and environmental studies in everyday living.

Whichever qualitative approach is used, even if it involves the use of some of the more recently-developed computer software packages, it will be a rather time-consuming one compared with doing quantitative research. This is the price that qualitative researchers pay for making detailed analyses of rich contextual data.

How do Geographical Educators know when they have a Sound, Consistent Research Study?

Inevitably the different types of qualitative research are questioned on the grounds

that they are valid and reliable. As Giorgi (1988:168-9) points out, the concepts of validity (i.e. a correspondence between a proposition and the ability of a referent to match the proposition) and reliability (i.e. the consistency of the match) belong to mainstream psychology and are tied to logical-empirical philosophy. By focussing on the use of phenomenological reduction and the concern for essences, Giorgi (1988:172-5) concludes that the reduction prevents a researcher from making empirical claims and the search for essences prevents the researcher from drawing conclusions about particulars and so directs his or her attention toward the essentials of a phenomenon.

Tschudi (1989) presents a very clear argument as to why people who use qualitative and/or quantitative approaches to research should adopt similar approaches to the question of validity in their studies. He argues that whatever "tribal banners" researchers use to describe their type of research, interpretations and conclusions must be justified. Such a concern for validity should be viewed as a means for guarding against human error.

Qualitative researchers are as passionate about their approaches to the research enterprise as are quantitative researchers. Therefore, while most qualitative researchers would ultimately agree with the argument expressed by Tschudi, many are uneasy about the use of the terms "validity" and "reliability" because these two terms use the language of logical empiricism. Therefore, theorists such as Ihde (1986), Spinelli (1989) and Kvale (1989) prefer to refer to the search for truthfulness rather than the search for validity in their studies.

The telling point to be made here is that the search to justify the conclusions of one's research normally occurs in the form of some measurement or formula for the quantitative researchers whereas it is a pervasive process for qualitative researchers. The author (Gerber, 1993a:45) has suggested that four fundamental aspects enable this pervasive process to be pursued consistently throughout the research endeavour. These are:

1. In the conceptualisation of the research question which becomes the aim of the study, the researcher should ensure that the overall research question is organised in such a way that it reflects the qualitative research approach to be employed. For example, in a phenomenological study to investigate the social effects of a natural hazard such as a tropical cyclone the research question could be "What is the nature of the human experience of a tropical cyclone?" whereas in a phenomenographic study on developing thinking skills in geography the research question could be "How do high school students learn to think about people-environment relationships?"

2. A Pilot Study should be used as a constructive device to refine the actual data-gathering questions. The real purpose of the Pilot Study is, therefore, to refine the non-technical questions so that they elicit from the participants in the study the fullest account of their experience of a particular phenomenon. The best non-technical question should be derived from a selection of questions that have been tried out with participants of the type and context that will be involved in the actual study. For example, in a study to ascertain how high school students viewed satellite images of parts of the world the following questions were tried out with a small number of high school students:

a) What do you understand about these pictures?
b) What makes these pictures special?
c) How are these pictures useful for studying geography?
d) What do these pictures tell you about the world?

The final question proved to be the one that offered the most access to the students' experience of remotely-sensed satellite images. It was, therefore, used to commence the series of interviews that were conducted to understand high school students experience of satellite imagery.

3. The collection of the data in qualitative research is a process that should be followed using the appropriate set of methodological principles. Often, interviews are used for this purpose. A sense of truthfulness to the research method is achieved when the researcher who undertakes phenomenological interviews: brackets his/her own lived experiences of the particular phenomenon; probes for fullest understanding of the participants' experience by revisiting their responses again and again until the external horizon of their experience is reached; and focuses on the intentional aspects of the participants' experience, i.e. the defining characteristic of human consciousness.

In an example of a qualitative researcher collecting data on teachers' experience of action for the environment, truthfulness of this process was achieved by the following actions:

a) Commencing the interview by posing the relevant non-technical question, e.g. How do you act as an environmentally responsible citizen?

b) Taking significant aspects of the participant's response and ask the person to reflect on his or her response until the fullest account of their experience is attained, e.g. Select aspects of the participant's response and have him or her develop some examples of what they mean by acting responsibly for the environment.

c) Refraining from injecting any of the researcher's beliefs about environmental responsibility into the conversation.

d) Gradually reducing the participant's experience of action for the environment until the essential aspects of this experience emerge. This involves a continuous process of reflection and reiteration of the participant's experience until its key elements being clear to the researcher.

Once the data have been obtained, they are prepared in a form ready for analysis, e.g. as transcriptions of an interview. The method of checking here involves the checking of the data with the audiotape or videotape of the interview for accuracy. The researcher can then feel comfortable in the knowledge that s/he has acted consistently throughout the data-gathering phase.

4. The analysis of the data will maintain this sense of truthfulness if it employs the following set of hermeneutic rules:

a) Orienting the analysis toward the phenomenon, e.g. How is recycling practised in a community?

b) Describing the phenomenon, e.g. recycling, as it appears to the participants rather than how it is observed by the researcher.

c) Treating all aspects of the responses as being of equal importance, i.e. horizontalisation of the data.

d) Checking the data for structural features that demonstrate the linkages amongst the different variations or the general similarities. This results in the development of essences of experience in the case of phenomenological studies and categories of description in the case of phenomenographic studies.

e) Using intentional variation as a basis for testing the clarity of the conceptions or meanings of the experience of a phenomenon.

The element of truthfulness, therefore, necessitates that the researchers understand the philosophy that underpins each of the qualitative methods that they seek to use. Once

the relevant philosophical principles have been grasped they offer the challenge to the researchers to apply them methodically to the research context at each step. As a result, qualitative researchers are able to make conceptual generalisations from their studies concerning experiences in specific contexts.

Conclusion

May I repeat the claim by Ference Marton that if the phenomenon is not well-understood then the research method that should be used is one of the qualitative ones. However, if the phenomenon is deemed to be understood by researchers then it is preferable to use a quantitative research method.

To maximise the potential of qualitative research methods, geographical educators need to read more widely in the areas of: qualitative research methods, related philosophies, epistemology and ontology. It is much more than a case of finding a research method and using it in a study with people in geographical and/or environmental education. It is a thorough research experience that is based on a known set of procedures and rules that have to be applied consistently and truthfully to a designated research question. It is certainly not a "soft" approach to research in geographical and environmental education. In some ways, therefore, it is more demanding than doing quantitative research because it is this author's opinion that the rules and procedures for conducting quantitative research are more widely known and accepted than those that fit under the umbrella of interpretive approaches. This will change as more researchers disseminate more outcomes from their qualitative research studies and educators can see the additional benefit of context-rich studies based on the experiences of the participants and not those of the researchers.

The implications for teaching, training and learning in geographical education that are derived from qualitative research studies are far-reaching because they focus on undertaking comprehensive studies about human experience in designated contexts. Because the experiences are mediated by the social institutions that permeate the research contexts, they offer an alternative perspective on the experience of teaching, training or learning. Such rich data often infers outcomes that may be divergent with popular professional beliefs. Even if the outcomes confirmed the results that have been published elsewhere they are useful because they usually express an alternative view about particular phenomena. A more radical view would say that qualitative research studies provide more comprehensive studies of human experience and therefore they are more useful to professionals who operate in an educational situation. Whatever, you believe, it is clear that the advent of qualitative research studies has changed the research environment for ever and has encouraged educational researchers to think much more closely about their research methods and their research questions than was the case in the era of the quantitative revolution.

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QUANTITATIVE EMPIRICAL RESEARCH
IN THE DIDACTICS OF GEOGRAPHY

Helmut Schrettenbrunner

Summary

New branches of sciences have to go a long way to define their own profile, and ten years of a IGU working group on "empirical research" have not been long enough to produce certainty on what the targets should be or how research should be undertaken. In this contribution it will be maintained that the definition of our independent variables is the crucial basis of our discipline: teaching methods connected with geographical media (maps, diagrams, profiles, models, photos). Out of possible organizational units we should select the school level, because the classroom level is mostly relevant to psychological research and the educational level mostly to general educational/philosophical considerations.

Introduction

Every settled discipline has a generally accepted set of aims which are distinctly different from neighboring sciences. Only new disciplines such as the didactics of geography have to fight for this self definition and have to clarify what their specific targets are, in our case we have to formulate the differences towards the science of geography and towards educational sciences such as educational psychology or general didactics.

All following considerations apply to quantitative "empirical" research which, of course, does not ignore the existence of other "empirical approaches" nor qualitative methods nor philosophical and normative directions, but it certainly underlines the author's personal commitment and preference.

Reduction of possible theories

Our choice of the theoretical basis will largely depend on the answers to the following questions:
1. What kind of organizational units do we consider?
Our selection should be the school level.

And not so much the classroom level, where inter-personal behavior is to be researched by educational pschologists (interactions: teacher-student, student-student, student-peer group leader), and not so much the educational level either, where curricula and superior standards of education are dealt with (usually set by ministries or educational authorities; but for examples of this type see Stoltman 1992, Hard 1978, who deal with syllabus planning and modernity clusters in curricula respectively).

The school level, on the other hand, guarantees that neither individual communication aspects nor classroom aspects specific of one school or one teacher prevail, but more general problems of teaching geography.

2. What type of answers do we expect from our discipline?
Here our choice should be descriptive and prescriptive rather than normative.

Normative approaches usually base on ultimate ends, on philosophical or social and political targets which are derived from moral, ethical and political principles of a society.

Empirical research usually takes learning objectives derived from such targets as granted and tests their effects under school conditions.

3. What relation between contents and methods do we expect from our discipline?
Our choice should rather be on methods and less on contents.

This also implies the degree of applied usefulness of our results. Teachers can mostly vary their methods and less their contents which are given by curricula. The question of contents and the selection of objectives, on the other hand, could also be of interest for empirical studies, but such decisions are considered mostly as given input.

If we sum up these considerations, we can define quantitative didactics of geography as a discipline which deals with learning/teaching methods in school geography on a descriptive/prescriptive level; it is no subdiscipline of geography, rather a subdiscipline of general didactics and educational science.

Its theories range from macrotheories of teaching methods to those of teaching objectives.

Selection of domain specific fields

There may be some danger that issues can be formulated in a too general way and loosened from the geographical context (e.g. do different software surfaces have learning effects?) so that several researchers of different subjects invent the wheel again. But if we keep in mind that the domain specific contents must be placed in the first line, the above question should be altered and specified (e.g. do complex software surfaces help to better understand multi level interpretations of satellite images because different results are visualized at the same time?) or seen in a wider context and thus lead to comparative studies across subjects (e.g. is such a method also useful in a complex ecological program?).

Domain specific fields can be easily listed (in brackets other subjects which have them in common).

field work (biology)
interviewing (sociology)
maps (history)
aereal photos (history-archeology)
satellite images (biology, climatology)
landscape profiles (biology)
plastic models (biology, physics, chemistry, arts)
abstract models and simulations (biology, chemistry, mathematics, economics)
diagrams (history, physics, mathematics, biology, economics)
statistical tables (history, physics, mathematics, biology, economics)

photos (history, languages, biology, physics, religious instruction, sports)
text analysis (languages, religious instruction, literature, history)

As can be easily seen from this list, we cannot maintain one and only one specific field but should rather select fields where our use in geography is predominant in comparison to other subjects. It may well be assumed that verbal presentation is less domain specific for geography than map reading and that a geography teacher could be helped better by giving him advice about map reading.

Typical tasks for research categories

If we can assume that our domain specific fields require adequate methods to facilitate learning then empirical research therefore must find out how domain specific contents must be taken into account to optimize the teaching and learning in school.

If furthermore we assume that contents have different levels of difficulty and that complex objectives can be broken up in a structured set of sub objectives we should find out what sequence is helpful.

1. Empirical research must find out what hierarchical order of objectives and learning situations facilitates the learning of complex contents (s. Stimpson 1992, Schrettenbrunner 1976)

Another domain deals with transfer between different learning fields in geography. The question could be: Do students learn from a merely cognitive unit about ecological problems how to behave in daily life?

2. Empirical reasearch must find out if there are transfer results between one hierarchy domain (cognitiv) to another (affective). For examples see Kim-Eng Lee 1992, Karpik 1992, Kross 1976.

This might also be applied to further transfers across one subject. Let us quote an example. If map reading is highly correlated with the general ability of orientation in space (IQ dimension space) one might test as well if the training in map reading raises the general ability which is measured outside geography by psychologists.

3. Empirical research must test domain specific learning effects against their transferability to the general development of personality and behavior (s. Schettenbrunner 1978).

And certainly at pesent the most usual domain of research: what teaching method or media give best results in combination with specific objectives?

4. Empirical research must find out how different teaching/learning methods and media effect results in different types of students (school types, stages of development, degree of involvement, pretest knowledge). For examples see the great number of contributions in handbooks like Gerber & Lidstone 1988, Schrettenbrunner & van Westrhenen 1988, Schrettenbrunner & van Westrhenen 1992, Brinkman et al. 1994.

Definition of our discipline by its independent variables

The above enumeration insinuates a number of independent variables by which a more precise clarification can be obtained:

1. different types of learning steps or learning situations
2. pre-knowledge, acquired degree of knowledge
3. different measures taken in geography lessons, different methods applied
4. contrasting learning methods, different school background, different student populations, different types of contents, different media.

Where as the independent variables can simply be summed up as "posttest-pretest scores, retention scores, degree of involvement, degree of ability (beyond geography)".

In combination with our first definition we can define quantitative empirical didactics of geography as a discipline which deals with learning/teaching methods in geography on a descriptive/prescriptive level, using theories concerned with hierarchies of contents, media, learning steps, methods, situations and taking into account student's pre-knowledge, attitudes, and school background.

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A REFLECTIVE REPORT ON AN ACTION RESEARCH TOWARDS UNDERSTANDING CONCEPTIONS OF ACTION RESEARCHHELD BY GEOGRAPHY TEACHERS

Tammy Kwan, John Lee

Abstract

This paper aims to report reflectively a project to study the conceptual understanding of Action Research by geography teachers. Despite the sending out of a questionnaire with both structured and open-ended questions to geography teachers in Hong Kong and Brisbane, the return rate was surprisingly low. However, from the limited cases returned, it is still of great interest to share with colleagues how we go about with the on-going work and also to reveal some of the interesting conceptions of these geography teachers upon the notion of action research which is worth sharing with colleagues. The low respondent rate is probably another indicator to suggest the idea of action research, though strongly advocated for teachers to adopt to improve and uphold their professional commitment, is nevertheless not one of the first few priorities taken by the teachers. Even if some teachers are working hard on it, the work is seldom made public or shared with by other colleagues. It indicates a pretty lonely battle fought by the practitioner teachers themselves. Hence it raises the issue of how truly can school authority and academic facilitators help to encourage and support teachers to move more willingly and positively to involve themselves in the enhancement of the kind of change that is of contribution to personal growth and professional development. It is recommended that sufficient emphasis and training should be provided in the foundational year when we prepare 'teachers' to take up their challenging role in the Educational Institution.

Introduction

The intention of this project dated back two years ago when Tammy, one of the writers attended the I.G.U. conferences at Boulder and Washington D.C., and the C.A.R.N. International Conference on "Culture for Change" at Worcester of England in 1992. Tammy came up with the puzzle that despite the notion of action research is highly praised by academics for teachers to adopt in schools to improve their classroom practice, personal growth and professional development, it nevertheless is initiated by the academics in the tertiary ivory tower and that they often assume the full acceptance by teachers without any query as they believe that action research has demonstrated the obvious merits in empowering teachers to promote change in positive and optimistic thinking. Despite also the attractive emphasis that doing action research enables teachers to generate valuable ground theory and posses the autonomy and ownership of such ground data, there is always some form of assumptions and expectations for a particular kind of action research be 'promoted' by the academics

to the teachers to follow. During the attendance of the three conferences, Tammy constantly asked herself, is this the only way for the actual practising teachers to accept and implement action research? Is the way that grass-root teachers conceive action research somewhat different from the academic experts? Are we so straight to define action research by following certain steps and certain forms before we recognise the work done by the teachers in their own work context? Is there a different way to understand why and how teachers, particularly geography teachers to my concern, conceive and commit themselves to do action research in their teaching environment? There are more questions to come and it is then realized that there won't be any quick answers unless the geography teachers are involved to ask about what they think is action research and whether they consider themselves as action researcher. Whether their response is yes or no, what are the facilitating factors or deterring barriers which influence the actual commitment.

Tammy then realized that she has this 'problem' in mind that she wanted to study and know more about the geography teachers' conceptual understanding of action research and to see if there is good congruent match or unamendable gap in between the academics and the geography teachers. Or put it this way, what is action research from the view point of the geography teachers? How do they see themselves an action researcher or not? If they regard themselves as action researchers, what is/are the kind/s of action research they are now doing in the teaching environment?

What is Action Research?

This section will briefly recap the history of action research development since it first came to existence in 1940s mentioned by Lewin. The essence, characteristics and assumptions of doing action research will be highlighted to represent the academics' view towards doing good and sound action research by teachers. This is then used as a framework to understand what the teachers think about doing action research in their schools. The views of the two parties are then compared to reveal match or mismatch upon the conception of action research.

For too long, teachers always see themselves to play the prime role of teaching, a medium to transmit useful information and knowledge to students (King and Lonnquist, 1992; Kwan, 1992; Oberg and McCutcheon, 1990). However, the teacher-as-researcher movement which is based on teachers' liberating themselves from ideas only imposed by others (the academic experts) outside the classroom is gradually gathering its momentum to spread into schools. In a way, this movement formally acknowledges and encourages that teaching as a profession, belongs to the teachers themselves and they are the experts of their own professional practice. Teachers are the fore-runners who are most appropriate to understand and refine their own teaching environment and hence to control the quality of teaching. To fully achieve this, teachers are much encouraged to do research about their own practice. The rationale behind is obvious. It is those frontier practitioners who face their students everyday to involve themselves to do personal research to improve their own teaching practice, and then the students will learn better and the school will also improve in performance. However, the prospect of involving or persuading the teachers to believe that their work should include the dimension of research is always daunting to them as they don't regard themselves comfortably suitable to be labelled as "researcher". For most of the time, they still view themselves as implementors of theories while theory generation is the work of the academics. So the question to ask is do teachers feel empowered, pushed or self-initiated to take up the new role of a researcher?

A brief developmental history of action research

Oberg and MuCutcheon (1990) describe the teacher-as-research movement an outgrowth of educational action research which aims to narrow the gap between social educational theories and its related practice. The purpose of teachers doing action research, either individually or in groups, are to improve their professional practice through better self understanding and articulation. Yet such idea or movement is never a new thing. *Action research* first originated in Kurt Lewin's work on the technical process of social change in the United States in the 1940s to bring about community workers to address their own intractable problems. Lewin's aim was to derive general laws of group life from careful observation and reflection on the processes of social change in a community (Lewin, 1946; Peters and Robinson, 1984; King and Lonnquist, 1992). It was Corey (1952) and Shumsky (1958) who borrowed the idea into education and urged teachers to become researchers in their own classrooms. But the contextual environment at that time was not matured to sustain their plead and hence action research simply disappeared into nowhere.

Somehow, the notion of action research was revitalized when the technical theories of curriculum did not match well with teaching practice in the classroom. John Elliott led his famous Ford Teaching Project (1973-1976) in Britain which, subsequently came to the establishment of Classroom Action Research Network (CARN), for the first time involved many teachers in practical collaborative action research in their own contextual environment, i.e. their classroom. This was almost simultaneously supported by Stenhouse's (1975) advocation that teachers should be directly involved in curriculum process and should play the role as researchers and developers as well.

According to educational experts' in the area, such as Carr and Kemmis (1986), Huckle (1991), action research in the 1980s "has often allied itself with critical social theory as an example of a democratic alternative to empirical analytical research" (Oberg and MuCutcheon, 1990:142). Such critical social theory attempts to provide a comprehensive and systematic critique of technical theories of curriculum and schooling and to propose an alternative approach based on collaboration and critical reflection done by educators and teachers working together to bring about positive change to schools. Schon (1983) supports the new role of teachers to be critical and reflective practitioners rather than the mere experts of knowledge transmitter in the very passive sense. In education, this means that teachers have become creators of meaningful knowledge for themselves that sound practical educational theories are grounded in the everyday realities of schools. Stenhouse (1975) has already described such active role taken by both teachers and even students in the creation of their own classroom knowledge.

This brief review of action research development since mid 1940s from technical to practical and then to critical emphasis, seems to have involved most of the views and comments made by the academics that they feel the need for the teachers to bring about real change in improvement of educational practice through teacher empowerment. With this, action research emerges as a very useful framework for teachers to pursue. However, the real practice of such self or group reflective involvement possesses a number of characteristics which imply a number of assumptions on doing action research as well.

Strategic steps and characteristics of action research

Grundy and Kemmis (1982:84) recommend the definition of action research produced by the 1981 National Australian Action Research Conference that:

"Educational or classroom action research is a term used to describe a family of activities in curriculum development, professional development, school improvement programs, and systems planning and policy development. These activities have in common the identification of strategies of planned action which are implemented, and then systematically submitted to observation, reflection and change. Participants in the action being considered are intricately involved with all of these activities." (ERDC, 1981)

Grundy and Kemmis later (1988:353) list three "minimal requirements" for action research:

1. The project takes as its subject-matter a social practice, regarding it as a strategic action open to improvement;
2. The project proceeds as a problem through a spiral of cycles of planning, acting, observing and reflecting, and so on;
3. The project involves those responsible for the practice in each of the moments of the activity.

Their definition and features point to the common characteristics that action research is grounded in the real world practice and experience of the teachers; that action research takes the spiral cycle of research activities; and that action research involves participation and collaboration of teachers as practitioners to act to bring about change for improvement (Lewin, 1946; Corey, 1952; Taba and Noel, 1957; Elliott, 1981; Hopkins, 1985; Carr and Kemmis, 1986 and McKernan, 1991). King and Lonnquist (1992:12) give a comparative summary of the major action research steps as advocated by the above academics through 1940s to 1980s, which is presented in Table 1.

The assumptions for action research
van Manen (1990:152) raised a number of uneasy questions to criticize the features and characteristics of action research. "What are the limits and possibilities of action research? Can action research live up to its promises?" The reason he raised these queries is that action research as a general framework for teachers to pursue lacks concrete substance (which he means the nature of the problem and the research techniques of dealing with this problem) despite there are a number of major strategic steps (See Table 1) to follow. However, all these features and characteristics seem to be sharing a number of assumptions which give the action research the main frame to stand. van Manen (1990:152-155) names them as:

1. *democracy* which assumes that the relationship between researcher and teachers should for moral and practical reasons be a democratic partnership;
2. *external knowledge* which is to assume that teachers are to operate on the basis of their own understandings rather than to become executors of the outcome as obtained from the traditional educational theories;
3. *reflection and action* which assume the intimate and natural integration of both to take place;
4. *change* which is to assume that change will bring about improvement in the teacher's own pedagogical practice; and
5. *teacher-as-researcher* which assumes the automatic role transformation.

Steps	Lewin(1946) U.S.A.	Corey (1953) U.S.A.	Taba & Noel (1957) U.S.A.	Elliott (1981) U.K.	Hopkins* (1985) U.K.	Carr & Kemmis (1986)Australia
Frame Problem	Generate idea.	Identify problem.	Identify problems.	Identify initial idea.	General idea/Problem identification.	
	Fact-find.		Analyse and determine casual factors.	Reconnaissance (Fact finding and analysis).	Critical reflection.	Conduct initial reflection in light of thematic concern.
	Conceptualize problem.	Formulate hypothesis.	Formulate hypotheses.		Formulate hypotheses.	
			Gather and interpret data.			
Plan	Overall plan. Decide first step of action.		Formulate action.	Create general plan of action steps.	Select methodology.	Plan.
Act	Execute first step.			Implement first action step.		Act.
Observe		Record actions.		Monitor.	Gather data.	Observe.
Reflect	Reconnaissance or fact-finding - evaluate, gather new insight, plan next step, and modify plan.	Infer generalizations.	Evaluate.	Reconnaissance.	Analyse data.	Reflect.
Repeat Process	Circle/spiral of planning, executing, and reconnaissance for evaluating, planning the next step and perhaps modifying plan.	Continuous re-testing of generalizations in action situations.		Revise general idea.	Maintain action. Report research. Review process.	Revise plan. Repeat cycle.

* Hopkins says he will present a series of methods and techniques for classroom research, not a step-by-step model. However, his book follows the steps listed.

Table 1: An Overview of Action Research Steps (after King and Lonnquist, 1992)

The reflective writings by the limited participating Hong Kong and Brisbane geography teachers of this study indicate that despite the implied importance to these assumptions, they are not fully accepted or visualised by the teachers and hence creating the situation that despite strong avocation of doing action research by experts and researchers, not all teachers involve or commit themselves wholeheartedly into so doing. This is of course partly explained by the enhancing environment provided by the schools and the willingness of colleagues to collaborate as well.

In brief, this section has outlined the developmental sequence of action research which first took place in 1940s with the aim to change and improve social work environment which was then subsequently picked up by the educators to bring about change for better teaching and learning effectiveness in classrooms and schools. The characteristics of socially critical action research, such as participation, collaboration, reflection and action, problem-solving, change for professional improvement and teacher-as-researcher are all crucial to the basic assumptions of doing action research. This is what the academics keep talking about action research should be like. But what about the views of the teachers themselves. Do they work according to expectation? Or do they have their own way of interpretation to these assumptions and then practise what is regarded as feasible in their own context. The following section tries to find answers to the questions.

Our Action Research: conception of action research by geography teachers

The introduction paragraphs have roughly outlined the derivation of original idea two years ago to find out the conception held by geography teachers towards the notion of understanding and doing action research. The idea first appeared to be ambitious to launch the study at international level. But the advice of 'think big and do small' kept coming back and it was finally decided to scale down to work on teachers of two cities first where attachment and connection are easier to facilitate the finding. Tammy collaborated with John, her critical partner to work on geography teachers in Hong Kong and Brisbane first.

The aims of this action research study are:
1. to find out how geography colleagues come to know about action research.
2. to find out the conceptions of the geography colleagues towards understanding the notion of action research.
3. to find out the extent that geography colleagues is involved in doing action research in their contextual environment.
4. to find out facilitators that encourage geography colleagues to commit themselves in doing action research.
5. to find out the barriers that withhold geography colleagues from doing action research.
6. to report a number of case studies which reflect the conceptions, dimensions and extent of geography colleagues practising action research in their own context.

This paper will report with particular reference to Aims 1,2,4 and 5 first while 3 and 6 will be reported later in another occasion.

The instrument
A semi-open ended questionnaire was drafted (see Appendix for the revised version) to find the following information and conceptual understanding of the teachers who

participated in this study. These include:

1. *How and when did the geography teachers first come to know about action research?*

   The purpose of this question is to find out the source which enlightened and introduced to teachers to know about action research. Despite the 50 years of action research development since mid 1940s, teachers can be very slow in getting to hear and know about action research.

2. *Using their own words to depict what they regarded as the salient characteristics of action research.*

   This question was deliberately set to encourage the teachers to write what they understand about action research without being influenced by the wordings of the subsequent questions. The way they selected to depict what they regard as salient characteristics also reflects their conceptual preference and understanding about action research.

3.&4. *Do they consider themselves doing action research? Whether the response is YES or NO, they have then to select one situation from different groupings which each essentially represents a dimensional characteristics of action research, such as whether it takes the characteristics of*
   - *self reflection or collaborative reflection;*
   - *reflection only or both reflection and action together;*
   - *reflection to improve his/her own geography teaching or reflection to improve the teaching of geography in the whole school curriculum;*
   - *making public the experience and result by sharing with other colleagues or just keeping everything to oneself;*
   - *self initiation or involvement in action research as prescribed by supreordinate; and*
   - *an one-off reflection or an on-going process of reflection.*

   The purpose of ticking the best situation from each of the groupings, which describes their current practice of action research or what they consider action research should be like, is to converge their conceptual understanding. It is also a way to confirm what they have written about the salient characteristics in the second part of the questionnaire.

5. *Do they regard themselves an action researcher? If yes, what are the facilitators? If no, what are the barriers?*

   The purpose of this question is to tap the contextual environment which support or discourage the teachers to become researchers and if so why they pick action research among all other options available to them.

6. *This last one is a demanding one as it invites teachers to write about their current action research project if they are in the midst of involvement.*

   The actual qualitative writing of such a piece of work which the teacher is currently doing and that this piece of work is believed by the teacher him/herself to have taken the form of action research reflects in-depth individual understanding and conception held by the teacher who claims himself or herself as action researcher. This is yet another way to depict the qualitative conception upon action research which is possessed by the teacher.

1. Reflection upon the design of the instrument

Since the instrument was designed to study the geography teachers' conception about action research, it is hence work under the assumption that who ever chose to

respond the questionnaire must have known or heard about action research before and therefore can proceed to give answers to the subsequent items. The question is simply whether the teacher regards himself/herself an action researcher or not. If yes, why and if no, why. However, we both agree that the instrument demands participating teachers to write quite a lot in order to capture their qualitatively consistent conception of action research and this is not normally liked by the teachers due to the very practical reason of time constraint (This is subsequently confirmed in their writing about barriers to do action research). Hence it is reflected in its obvious low rate of return by teachers particularly those sent out in Brisbane. However, because there is no singular approach or model exist to prescribe the definite way of conducting action research (van Manen, 1990), it yet gives flexibility to modify the target and refine problem after the action research spiral is begun. The few return questionaries still provide us with a substantial amount of information about knowing the teachers' conceptions. We are not to generalize conceptions held by the responding teachers but to report and describe the qualitatively different conceptions, if ever exist, among the few responded teachers. This can at least be regarded as the starting point of our action research spiral for further and future action to build upon. Hence, once the understanding and agreement were reached among two of us, we felt much at ease about the low rate of return (9 questionaries return). But of course, we need to revise our instrument to make it more approachable and friendly to the teachers. Since our focus is to find out the different kinds of conceptions held by teachers upon action research, we can organise groups of teachers to gather together to talk about their experience, views and their actual work involved in the action research framework in the form of focussed group discussion. This is yet another way to collect group opinion and encourage group reflection upon what they think of action research. During the focussed group interview, we can identify members by extending invitation to write about their own action research project in greater detail. If not, at least attempt can be made to conduct a more in-depth personal interview to elaborate more on the nature and characteristics of this particular action research example as conducted by this particular teacher. It is in fact our intention to study such conceptions held by geography teachers.

2. Findings and discussion
1. When and how did geography teachers know about action research?
Despite the existence of at least 50 years since first mentioning by Kurt Lewin, action research is only recently known to the geography teachers in Hong Kong and Brisbane. Among the nine teachers responded, four of them first knew about action research in 1993 which was just last year. One knew about it in 1991, two in 1990, one each in 1989 and 1987. In other words, the time taken by this group of geography teachers to know action research is really long since its first emergence. However, if referred back to the developmental history, it can easily be understood as action research was revitalized almost in 1980s. Taken the time to diffuse the innovation into schools for teachers to adopt, it becomes understandable that why 1987 was the first year among the nine geography teachers to first know about action research. Nevertheless, it is still of interest to see a clustering time in the early 1990s that action research seems to have gathered the momentum to spread into schools. One possible reason to explain such a momentum to take place in Hong kong was the first formal introductory workshop by Kwan and Ghaye (1991) in the 8th Hong Kong Educational Research Conference on "Action Research into Action .... with

Teachers" which was well attended by about 40 teachers.

Also interesting to note is that eight of the teachers said that they knew about action research from seminars given by or conversation with the university academics while only three mentioned the source of knowing is from books and journals. This seems to point to the fact that face to face contact provides a better chance to introduce the idea of action research to teachers while writing in books or journals are possibly read more often by academics but not by the practising teachers. It hence draws our attention to ask in future that to what extent are such writings made available to be read by teachers with convenience?

2. What are the salient characteristics of action research considered by the geography teachers which reflected their conceptions on action research?

Table 2 below summarizes what each geography teacher wrote about the salient characteristics of action research. The remark column infers their conceptual preference and assumptions as related to these characteristics.

The remarks column of Table 2 highlights the free depiction of salient characteristics of action research as conceived by the geography teachers. It hence helps to reveal five major conceptions held amongst these nine geography teachers. They are:

i.   Action research is a self-reflective process aiming at general improvement in professional practice.
ii. Action research is a self-reflective process aiming to improve mainly pedagogical competence.
iii. Action research is a group-reflective process and act collaboratively to bring about change in the work-place environment.
iv. Action research is an on-going cycle of reflection which involves six major steps of operation: problem identification, planning, acting, observing (fact-finding), reflecting, and replanning.
v.   Teachers are researchers in the inquiry process to generate or reconstruct knowledge.

However, it is of interest to see that only one teacher mentioned the characteristic of empowerment and two mentioned the democratised principle embedded in between all the participants involved in the process of doing action research and another one mentioned the sharing and making public of the teacher's work.

3. Did the geography teachers consider themselves currently doing action research?

The description of salient characteristics of action research given by the nine teachers in Table 2 is categorised into brief, fair and good description according to the number of characteristics mentioned. The way that teachers describes these characteristics is matched with their time of knowing action research and with whether they regard themselves currently involved in doing action research. Table 3 presents the summary of these three pieces of information. It is found that all the four teachers who are now doing some action research only know about action research for a very brief period of time (1 to 4 years) but yet their category of description is regarded to be brief and simple. Only one teacher (B) who regards herself an action researcher despite she is now not doing any at the moment. She

Description of Salient Characteristics	Remarks
Action research involves evaluating a project as an ongoing process. The results of your initial evaluation are used to improve the project. The measures taken are evaluated and the results asked upon and so on. This methodology of necessity requires the researcher to be part of the project being evaluated. (Brisbane Teacher A)	*on-going,* *evaluate for improvement,* *insider participation*
* engages participants in reflection, action, evaluation and ultimately reconstruction of knowledge; * on-going; * empower participants, have control over direction of research; * a co-operative learning activity with more emphasis on the group participating and contributing than on the individual; * equal professional standing of all participants. (Brisbane Teacher B)	*common steps of doing action research (on-going),* *construction of grounded knowledge,* *on-going,* *empowerment,* *autonomy,* *group collaboration,* *democracy*
Observe -> identify problems/issues -> design a plan for action -> implement the plan -> evaluate changes -> evaluate plan (Brisbane Teacher C)	*common steps of doing action research (but no mentioning of on-going as the arrow stops towards the last stage),* *action for change*
* In action research, both teachers and students can play their part in collecting data, expressing their viewpoints and finally making possible improvements in pedagogical practice. * It is a continuous and ever up-dated process for in-service training of the teachers. * Mutual benefits are obtained for both parties through the process of project planning, action, evaluation and feedback. * It requires a systematic, careful and adjustable planning and constant investigation throughout the whole research process. * Students should learn consciously with awareness and conduct retrospection and critiques at regular intervals. (HK Teacher D)	*teacher as researcher,* *on-going,* *modify as proceed,* *focus on pedagogical improvement,* *professional in-service training,* *common steps of doing action research mentioned,* *involve students in the process*
It is a self-reflective enquiry by the participants to improve their own practice. The participants interlink their reflection with their action. They set research question, gather data, solve the research problem by executing the research and evaluate them. As the participants are researchers, their work and experience are known to the public. The participants collaborate among members of the group as "critical friends" who observe lessons and give comments. Democratic principles are embodied in the research, as the participants are allowed to influence the conditions or their own work and criticize the situation of other members of the group. The participants go through the self-reflecting spiral cycle of planning, acting, observing, reflecting and replanning. As it is a research, it generates knowledge and contributes to educational change. (HK Teacher E)	*self and group reflection,* *reflection for improvement,* *reflection and action,* *common steps noted,* *participants are researchers,* *sharing outcome and made public,* *collaboration with critical friend,* *democracy (equal standing),* *change work conditions,* *on-going spiral cycle,* *new knowledge generation*

* action research can be done in a very small scale. * action research does not require sophisticated research design. * The researcher actually self-conducts the research during his/her daily practice. * the research findings can help the teacher improve his/her teaching. * through the research process, the teacher involved can reflect on his/her own practice and seek improvements. He/She in such a way does not regard teaching a routine or prescribe form of behaviour. * action researcher may also involve another colleague of his/her own who facilitates the research process. This colleague should also be highly motivated to improve on teaching and learning. (HK Teacher F)	*scale of action research, flexible research design, self-participation and reflection, reflection for teaching improvement, research and daily teaching occurs simultaneously, collaborative critical friend/partner (but not a must to have such a person)*
Action research may be described as inquiry conducted into particular issues of the classroom/teaching matters, with the aim of implementing a change in a specific situation. it is usually taken by the teacher him/herself. (HK Teacher G)	*problem solving inquiry, concerns classroom teaching practice, aim to bring about a change, teacher-as- researcher*
* Teachers reflect to improve teaching of geography. * Teachers reflect to see if the students can relate the knowledge they acquire with the outside world. * Teachers reflect to work together to keep pace with the trend of teaching geography. (HK Teacher H)	*mainly self reflection, no action implied, reflect to improve teaching, reflect to improve students' learning, reflect together to update one's subject knowledge*
* explore new teaching techniques. * extensive reading of selected topics, e.g. library search to formulate interesting hypothesis. * statistical testing of hypothesis on fieldwork data. * organizing fieldwork, field trips or field camps. * attending geography seminars, talks or courses related to selected topics. (HK Teacher I)	*emphasize specific geographical teaching techniques used, individual refreshing by attending various educational circumstances.*

Table 2: Description of Salient Characteristics and Conceptions of Action Research

actually has given quite a fair bit of description of the salient characteristics about action research (See Table 2, Teacher B) and in fact she is the one among all of the others who first came to know about action research through all the sources of books, journals and from academics.

Despite all the differences exist in self image of being an action researcher or not, they do exhibit a high degree of similarity or perhaps even a refinement and elaboration of salient characteristics when asked to choose the best situation in each grouping (See paragraph **C.a.**3-4) which describes their current practice or the preferred practice of doing action research. This is the reason why we asked the teacher to tick these situations only after they have written freely about what they consider as salient characteristics of action research. The following lists some of the situations that they have chosen which are worth mentioning and these can be used to compare their conceptions as discussed in Table 2.

i. Three teachers see action research a self-reflection exercise while the other six see it a joint venture by working closely with other colleagues.

ii. Four teachers see action research is there to improve the teaching situation while the other five see it a mechanism to improve pupils' learning outcome.

iii. Three teachers relate reflection and action together while the other six teachers include the notion of on-going development and modification of plan as it evolves along.

iv. Six teachers care to use action research to improve the teaching of geography as an independent subject and the other three want to expand the importance of the subject to a whole school inter-disciplinary formal curriculum level. Yet none of them see it fit to relate it to the informal curriculum as their possible focus of action research.

v. In terms of making the result known to the public, all but one teacher prefer to have some form of sharing. But the extent of sharing is quite different. Four of them prefer only occasional sharing the experience and outcome of improvement with other non-involved colleagues. Three of them prefer to do such kind of sharing more frequently and only one teacher chooses to present in a seminar or conference of what has been achieved and learnt throughout. None of them tick the option of writing an account to make public of what's being achieved. Only one teacher chooses to work on her own to achieve the aim of improving her teaching practice/situation but no sharing to take place.

vi. All the four teachers who consider themselves currently doing some action research choose to take the initiative to start the action plan to improve the teaching practice/situation while the other five who are not currently doing action research prefer to join their colleagues to execute the action plan to improve teaching practice/situation. All of them see such action plan of improvement an on-going process subject to modification from time to time whenever it is necessary. None of them see it an one-off exercise.

4. What are the facilitators and barriers of doing action research?

In this part of the questionnaire, the geography teachers were asked whether they considered themselves an action researcher despite he/she is not currently doing one. And if so, whether the answer is YES or NO, what are the facilitators and barriers. Table 3 has already indicated that Teacher B is the only one who considers herself an action researcher even though she is not doing at the moment. For the other, they are all consistent with the current status, that is, if they are currently doing an action

Teacher	Yr of first knowing action research	Description of salient characteristics	Currently status of doing action research	Are you an action researcher?
A	1989	brief	no	no
B	1987	fair	no	yes
C	1993	brief	no	no
D	1993	fair	no	no
E	1990	good	no	no
F	1990	fair	yes	yes
G	1991	brief	yes	yes
H	1993	brief	yes	yes
I	1993	brief	yes	yes

Table 3: Who are currently doing action research?

research, they see themselves an action researcher. Table 4 below tabulates each teacher's view towards facilitators and barriers of doing action research.

Referring to all the discrete evidences as given by the nine geography teachers, a summary list of enhancing facilitators and blocking barriers is obtained. In general the facilitators are:

i.   self-positive attitude;
ii. open characters to work with colleagues, share experience and receive criticism;
iii. recognition of effort by school authority, colleagues and students;
iv. actual school support given in the form of training, time release and resource backup; and
v.   relevant knowledge to pursue the new leadership and research role in action research.

The barriers are very obvious. They include:

i.   time constraint;
ii. heavy and over workload;
iii. not familiar with the techniques and knowhow;
iv. egocentric beings and no communication and sharing between colleagues; and
v.   no support and recognition from school.

It is interesting to see that the opposite meanings of the facilitators are in fact the barriers. But the facilitator about teacher's open character, positive attitude and self-incentive to strive for self growth, professional improvement is worth developing in the teacher training programme to educate teachers to realize their new role and expectation in the teaching frontier. This can hardly be implanted once the attitude is solidified. We are not inclined towards inculcation but to elicit to teachers that these are the new wave to sustain momentum to strive for improvement, satisfaction and achievement.

E. CONCLUSION

This study is by no means a comprehensive one as it is limited by the number of teachers who actually responded to the instrument and geographical application. Nevertheless, it does capture some of the ideas and understanding of these teachers in seeing themselves as action researcher or not. They don't normally do action research to possess all their assuming characteristics as modelled by academics. They do however, choose to work in whatever environment that enable them to do some form of action research to improve perhaps one very specific aspect of their teaching practice. Despite knowing the need to collaborate, they more often prefer to self-reflect as it obviously is easier to manage. But to work towards broader scope of achievement and to bring about bigger step of improvement, there is the need to provide earlier training to sustain teacher's positive outlook and attitude when they first involve in preparing themselves to become teachers. It is also hoped that with enough reflective reports collected from geography teachers from different countries, an occasional paper prepared by the Centre of Applied Environmental and Social Education Research (CAESER) can be produced to make public the important ground work done by the geography teachers in this perspective.

Teacher	Action Researcher?	Facilitators	Barriers
A	No		: Time, : Techniques and knowhow, : Writing the account.
B	Yes	* Self confidence in educational theory and practice, * Knowledge of specialised area, * Preparedness to learn from others and share with others, * non-egocentric disposition, * rapport and acceptance by peers, * creditability, * able to make time	: time constraint : communication
C	No		
D	Yes	* support of colleagues, * involve enthusiastic students to participate, * encouragement from school authority, * self-initiation and self incentive to improve, * with techniques and knowhow, * appreciation by students	
E	No		: time consuming, : heavy workload, : not enough openness to receive criticism and to be observed, : not used to work in collaboration, isolation tends to dominate, : unsystematic self reflection, : difficult to maintain an on-going process.
F	Yes	* optimistic outlooking - always room for improvement, * teaching is dynamic and needs to cater for change, * professionalism, * has genuity in educational issues, * appropriate training in post-graduate programmes.	
G	Yes	* co-operation from colleagues, * school support, * time-release to enable involvement	
H	Yes	* self enthusiasm * co-operation from colleagues, * willingness to share, * a new role image of teacher - researcher	
I	Yes		: heavy workload, : insufficient time, : lack of updated books/magazines available to school, : little communication among geography teachers, : financial limitation, such as books and equipment (Note: this teacher is referring to doing of field work with students).

Table 4: Facilitators and Barriers of doing action research

Appendix: To sustain the network of communication and understanding

After you have read the paper, we appreciate feedbacks or dialogues from geography colleagues all over the world. Here, we have a message to invite and involve your participation to our study project .

Dear Colleague,

You are cordially invited to participate into this joint international research study prepared to be reported at the next I.G.U. conference held in 1996 at Hague. Teachers recently are much encouraged to take up the role as action researchers in their own setting to achieve professional development. It is our interest to see how teachers themselves conceptualize and operationalize the idea of action research in their workplace. It is our wish to find out what is actually done in schools, institutions or classrooms by our geography colleagues. Your support to complete this questionnaire is much appreciated.

The aims of this study are to:

1. find out the conceptions of the geography colleagues towards the notion of action research.

2. find out how geography colleagues come to know about action research.

3. find out the extent that geography colleagues is involved in doing action research in their contextual environment.

4. find out the facilitators that encourage geography colleagues to commit themselves in doing action research.

5. find out the barriers that withhold geography colleagues from doing action research.

6. report a number of case studies which reflect the conceptions, dimensions and extent of geography colleagues practising action research in their own context.

May we thank in advance for your support and co-operation to this study project. It will be much appreciated if you can pass this questionnaire to about 10 geography school teachers of your place to ask for completion. Please return the completed questionnaire to Ms Tammy Kwan at School of Social, Business and Environmental Education, Queensland University of Technology, Kelvin Grove, Locked Bag No. 2, Red Hill, Q4059, Australia, the latest, by the end of December, 1994. Thanks with deepest regards.

John LEE	Tammy KWAN
(Hong Kong)	(Australia)

1. How did you first know/hear about <u>action research</u>?

a. When did you first get to know about <u>action research</u>? (which year) _____

b. Where did you first get to know about <u>action research</u>? (eg. from books, from conference, from educational talk, from seminar, introduced by other academics etc. Please provide details if possible.)

_____

_____

2. Using no more than 10 full sentences, please write out what **YOU** consider to be the salient characteristics of an action research.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

3. Do you consider yourself doing action research now? Yes [   ]   No [   ]

4. If your response in 3 is "Yes", please "tick" one situation from each box below which you think best describes your present situation of doing action research.
If your response in 3 is "No", please "tick" one situation from each box below that you think best describes the situation of doing action research.

4.1.a	[ ]	You are reflecting on your own mainly to improve your teaching situation.
4.1.b	[ ]	You are reflecting on your own mainly to improve pupils' learning outcome.
4.1.c	[ ]	You are reflecting closely together with other (one or more) colleagues to improve the teaching situation.
4.1.d	[ ]	You are reflecting closely together with other (one or more) colleagues to improve pupils' learning outcome.

4.2.a	[ ]	You relate reflection and action to improve your teaching of geography.
4.2.b	[ ]	You systematically reflect and modify the action plan to improve your teaching of geography.
4.2.c	[ ]	You reflect mainly to improve your teaching of geography.

4.3.a	[ ]	You are working to improve the teaching of geography in the whole school inter-disciplinary formal curriculum.
4.3.b	[ ]	You are working to improve the teaching of the geography in the whole school in-formal curriculum.
4.3.c	[ ]	You are working to improve the teaching of geography as an independent subject.

4.4.a	[ ]	You are working on your own to achieve the aim of improving your teaching practice/performance.
4.4.b	[ ]	You occasionally share the experience and outcome of improvement with other non-involved colleagues.
4.4.c	[ ]	You write an account to make public (eg. to school magazine or educational paper or journal) of what you have achieved and learned throughout.
4.4.d	[ ]	You frequently share the experience and outcome of improvement through regular meeting with other non-involved colleagues.
4.4.e	[ ]	You present in a seminar or conference of what you have achieved and learned throughout.

4.5.a	[ ]	You initiate the action plan to improve the teaching practice/situation.
4.5.b	[ ]	You join your colleague(s) to execute the action plan to improve the teaching practice/situation.
4.5.c	[ ]	You are asked by your superordinate, such as the head teacher or principal, to devise action plan to improve the teaching practice/ situation.

4.6.a	[ ]	Your action plan of improvement is an one-off exercise.
4.6.b	[ ]	Your action plan of improvement lasts for a certain time interval.
4.6.c	[ ]	Your action plan of improvement is an on-going exercise.
4.6.d	[ ]	Your action plan of improvement is on-going and is subject to modification from time to time.

5. Do you regard yourself an action researcher?

       Yes   [ ] Could you suggest five facilitating reasons which enable you to become an action researcher?

OR   No   [ ] Could you suggest five barriers which prohibit you from becoming an action researcher?

6. If you are currently involved in doing an action research, are you willing to write up your case in about 2000 words outlining how you have started to do it, what you are doing, how you go about doing it and the achievement and satisfaction that you get from doing this piece of action research, **upon request?**

       Yes   [ ] Can you turn in your writing to Tammy Kwan at S.B.E.E., Q.U.T., Kelvin Grove, Locked Bag 2, Red Hill, Q4059, Australia by 31st March, 1995 (the latest)? **With special thanks.**

       No   [ ] But I am willing to keep in touch if necessary.

Thank you very much for your valuable time in completing this questionnaire and participate positively and actively to give contribution to this project.

If you want to know more about how other geography colleagues are involved in doing action research, please complete the following brief personal information, we will keep you informed of our findings.

Name: _____

Institution/School Name:_____

Institution/School Address:_____

_____

Position in Institution/School:(e.g.Geog Teacher/Geog Head Teacher/School Deputy Head/ Lecturer etc.)

      _____

Correspondence:_____

_____

Phone number:_____ Contact fax number:_____

Email address:_____

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THE INFLUENCE OF PLACE ON ADOLESCENTS THINKING: A METHODOLOGICAL PROBLEM

Margaret Robertson

Abstract

The influence of prior knowledge on thinking skills and learning approaches is well recognised in educational psychology. However, identifying the sources of such personal context based learning is much more difficult. The problem is one of externalising the experiences of people in ways that are measurable and transferable across settings. This paper reports on research with adolescents that considers the problem from the perspective of people/place interactions. Groups of adolescents from contrasting geographic locations were participants in two studies. As a means of construct validation for the hypothesis that place will influence the thinking skills and learning approaches of adolescents Study One used a qualitative approach. Study Two pursued the outcomes of this and relevant literature with a selection of sixty-five variables related to attitudes and environmental preferences in addition to general reasoning and spatial skills, and learning strategies. Findings support the general hypothesis that adolescents' thinking is influenced by long term place of residence (p<.01) especially in relation to visual/spatial tasks.

Introduction

Humanists have long sought ways to comprehend the complexities of human behaviour. Their efforts are compounded by the unique contexts of experience and the intervention of prior learning and knowledge (Marton, 1985). Until recently psychologists were prone to dismiss the importance of prior knowledge and experience to behaviour by pursuing a mechanistic view of human intelligence. The focus was on the social and cognitive development of the person or aspects that were measurable and observable within large populations. Furthermore, the settings for research have been primarily within the physical surrounds of formal institutions such as schools and universities. A reconceptualisation of intelligence, however, has shifted the debate away from the positivist framework that dominated intellectual thinking for the middle part of this century (Rowe, 1991). Interest by psychologists and educators in the humanist perspective has been revived and cognitive psychologists have begun to reinstate the importance of prior knowledge and include this in their theories of intelligence and cognitive functioning (Sternberg, 1987; Gardner, 1983; Biggs & Collis, 1991).

The problem that has baulked thinkers since Aristotle and Plato seems unchanged. That is how to access lived experience, or the subjective experience of meaning. As Milgram (1973) observed: "The major methodological problem ... is how to externalise the mental map, that is, how to get it out of the individual's subjective experience and onto paper for public scrutiny" (p.24). This paper describes research

that sought understanding of the problem by reviewing the context of 'real world' experience or the place where people live. Two studies are outlined. As both were exploratory, open-ended questions and a wide diversity of variables were structured into the designs. Study One was designed to provide the construct validation for the central hypothesis regarding place influence. Study Two followed with a wide variety of qualitative and quantitative measurements signalled by Study One and the literature reviewed. The aim was to determine behaviour embedded in experience that is measurable and transferable across settings.

Background Information

Place has been described as the "material and symbolic product of human action" (Stokols & Shumaker, 1981, p.442). The phenomenon known as place is viewed as a force that influences human behaviour. At the same time human and physical action constantly modify the character of place, its people, and setting. People and places are bound together by a sentiment which the philosopher, Tuan (1974), referred to as *Topophilia*. Topophilic sentiment, in Tuan's view, may be to the soil or the sea, or equally to a neighbourhood where home and family contain most of a person's emotional ties. At the same time the environment or place has a role in providing images so that topophilia has context. In the end the result is a world view that is "constructed out of the salient elements of a people's social and physical setting" (p.79). So strong is this feeling that in some societies there is a blurring of identities of person and environments (Ittelson, Franck, & O'Hanlon, 1976). In others there is cognisance of shapes and colours that relate to experience (Lowenthal, 1975). Experience of the environment means identifying with people, material objects, surroundings, and "with one's actions in and upon it" (Lowenthal, 1975, p.203).

Very few explanations for behavioural change have sought to refer to the physical environment for answers to observable differences not explained by the maturation process, and/or the social environment (Holahan, 1983). Perhaps as Stokols and Shumaker have noted (1981), this is hardly surprising given the complexity of large scale environments. As Canter (1983) observed, the processes involved in experiencing may be the same for people in different places, but the content of those processes will differ from one place to another, and from one person to another. The content of prior experience will be related to the place or contextual setting in which the experience occurs. The underlying attributes of place, therefore, can be a legitimate and important influence on the thinking skills, and intellectual development of humans.

A personal conviction in the value of holistic or anti-reductionist views of human behaviour coupled with curiosity about the role of place led to the development of two exploratory studies. Central to both studies was the belief that place differences in people's attitudes, behaviour and thinking skills could occur as a result of the close bondage between the setting of experience and the intellectual and social development of the person. Verification for the hypothesis that place will influence the thinking skills, attitudes and perceptions and learning behaviour of people was sought from comparative data collected from individuals located in a number of different geographic settings or places . By focusing on the interactions between people and their place of residence there was an attempt to explore the totality of human experience. Emphasis on physical settings did not exclude such variables as home, family, and school. Physical and social settings, objects, and people were included.

Indeed, all variables form integral parts of the maze of characteristics which, in totality, is termed "place". As such the challenge was to select appropriately.

The target populations for the two studies described were adolescents. As a specific age cohort, adolescents were seen to be on the verge of adulthood and while near the peak of their development years they were likely to have reasonably homogeneous experiences on which to base their responses. With the research focus on the broad experiences and behaviour of the person, the possibility existed to investigate the links between everyday experience and cognitive functioning. As well, if the emphasis was on the lived world, then similar insights were possible concerning environmental perception. In the former, an open-ended approach to the nature of everyday experience through individual case studies had the potential to highlight the importance of place to thinking. The discovery of a direct link to place was considered possible if research tasks focused specifically on the latter, or environmental meanings. Furthermore the discovery of any shared meanings in the context of 'place' might explain, in part, the development of thinking skills in formal schooling. The associations between place, thinking skills, and learning behaviour were central questions in the enquiries of the two studies.

Study One

Studies of adolescents' environmental perceptions have indicated a number of shared attitudes (Silbereisen, Noack, and Eyferth, 1986; Silbereisen & Noack, 1988) including an attraction to nature and leisure activities related to sports, home, and street settings. These studies suggest that experience of place is goal directed (Canter, 1983) and strongly associated with familiarity or 'legibility' (Kaplan, 1987). Other studies have shown that feelings towards the environment are associated with concepts that may have links to thinking (Kaplan, 1987; Tuan, 1974). The possibility existed that place differences in cognitive behaviour are measurable at neighbourhood levels and not simply, as has been the focus of some previous research into the field (Goodnow, 1970; Sternberg, 1987), at the macro levels of cross-cultural studies.

Study One pursued the need for a well-grounded theory that would give a clear indication of the value of the research aim. A qualitative approach was used to produce a rich set of data, with seventy-nine year nine students of approximate age fourteen, in four contrasting physical environments within Tasmania. In response to the task of grouping fifty photographs of scenes from around Australia, these adolescents revealed shared meanings and perceptions consistent with their residential location. At the same time, regardless of place all participants indicated a strong attraction to nature. As with other research studies (Zube & Pitt, 1981; Zube, Pitt & Evans, 1983; Silbereisen & Noack, 1988), the evidence pointed to the possibility that common environmental perceptions are a function of the age and development of adolescents. At the same time they also have some place specific understandings. For example, different language concepts and visual perceptions were present in the categorisation process used by the four groups of adolescents. Rural and urban differences were apparent, as were differences related to accessibility possibly as a function of personal mobility or physical proximity. Furthermore, each group revealed differences in environmental attitudes, leisure activities, and experiences of home and other places. Cross-validation of data supported the claim of place specific knowledge and related thinking skills. Statistically significant differences ($p < .0001$) were recorded between all groups with respect to their category frequencies. This led to

the conclusion that long term residence in a particular environment will contribute to the growth of shared meanings in communities. Place specific behaviour, the central theoretical construct of this enquiry, was evident in the qualitative analysis adopted for Study One and provided positive directions for further analysis.

From the knowledge gained, four theoretical positions were offered: that physical location provides unique experiences for the individual that may be reflected in concept knowledge and environmental perceptions; diversity of experience is related to size and complexity of the community; travel broadens the information base of experience and facilitates flexibility in thinking; and that attitudes to study may reflect outcomes of interactions between people and places.

Study Two

Findings from Study One, together with other research findings, were used to isolate the specific variables for inclusion in Study Two. In the choice of variables there was a deliberate plan to select more widely than previous research had indicated. In so doing and to identify clearly the contribution of place, the intention was to highlight as many relationships as possible. A narrow approach would possibly distort the outcomes and lead to ill-considered assumptions about the potential connections. There was also the fear that inferences based on expected outcomes might be made through inadequate cross-referencing, especially in a climate where there are established and strongly researched paradigms. If the influence of place were to be clearly identified, then there could be no doubt of its role. Hence, there was a conscious decision to avoid the perceived dangers of a specific focus on a few variables. In Study Two this resulted in the final selection of sixty-five variables.

Differences in background place characteristics, attitudes, and perceptions were variously measured by parents' occupations, background travel experiences, leisure pursuits, and attitudes towards distance. In addition experience was assessed from open-ended questions regarding place preferences, leisure preferences, and a semantic differential related to travel attitudes. Thinking skills were tested both for general reasoning ability and domain specific skills related to environmental perception, including spatial ability and visual perception, both nonverbal and written. Further variables included attention and concentration, and 'creativity'. The third theme was learning and study approaches.

The list of variables, although extensive, was not exhaustive. This is an inevitable outcome of such a complex investigation. So much of the study was concerned with the intangible qualities of human experience that any selection procedure could be argued as a limitation of the study. However, there was increased confidence that the final decisions regarding variables, if not adequately embedded in previous research, were grounded in theory resulting from the rigorous research procedure conducted in Study One. The aim of the study was exploratory and not meant to be definitive.

The data for Study Two were collected from random samples of thirty adolescents (N = 322), selected from the year ten age group in secondary high schools located in seven different places again within Tasmania. In the selection of places there was recognition of rural and urban differences, as well as income differences and specialist settlement functions such as mining. Also, there was a possibility that people from places with similar characteristics might have similar views. The final set of places consisted of Places A and B which are located in rural surroundings, Place C located in a mining community, Places D and F located in high income

urban locations, and Places F and G located in low income urban locations.

In each place, tests were administered to entire groups of adolescents. Table 1 reports analyses of variance results for Places A - G for all thinking skills tests.

Table 1: Analysis of variance results for Places A - G: thinking skills tests

Variable	df	F value	p < 1
IQ	6	15.97	.0001*
Test 5	6	3.83	.0012*
Task 1	6	7.64	.0001*
Task 2	6	11.41	.0001*
Task 3	6	7.04	.0001*
Test 10	6	7.27	.0001*
Test 11	6	6.61	.0001*
Test 12	6	7.74	.0001*
Test 13	6	3.25	.0045*
Test 14	6	11.71	.0001*
			(*p < .01)

They were a test of general mathematical and linguistic reasoning (IQ) (Australian Council for Educational Research, 1990) Test 5 a measure of spatial perception based on an embedded figures test, Tests 10 - 14 measuring attention and concentration (Rowe, 1986) and Task 1 - 3 measuring visual responses to environmental photographic stimuli. While previously validated instruments were used for the first two sets of tests the latter relied on a specifically designed instrument the *Assessment Scale of Responses to Visual Stimuli*. This instrument relied on the compilation of secondary and tertiary teachers' views and succeeded in stimulating some useful issues for discussion through analogies with the SOLO taxonomy.

Other data to be statistically analysed included results from the semantic differential based on adolescents attitudes towards 'travel'. Table 2 shows the analyses of variance for all places based on a three Factor solution.

Table 2: Analysis of variance by Place for Factor 1, Factor 2, and Factor 3 (df = 6)

VARIABLE	F Value	P > F
Factor 1	2.20	0.0444 **
Factor 2	1.11	0.3572
Factor 3	3.74	0.0015 *
		(*p < .01, **p < .05)

Biggs' (1987) *Learning Process Questionnaire* was used to evaluate attitudes towards study and learning. This instrument measures motive and strategy in study approaches towards classroom learning. Both learning process variables were to prove useful in describing differences in the profiles of each group of adolescents, including their possible self-regulatory attitudes towards learning. The results of analyses of variance are reported in Table 3.

Table 3: Analyses of variance results for Learning Process Questionnaire scales

Variable	df	F value	P > F
Surface motive	6	1.74	.1132
Surface strategy	6	3.01	.0078*
Deep motive	6	1.51	.1770
Deep strategy	6	2.34	.0330**
Achieving motive	6	1.70	.1222
Achieving strategy	6	3.91	.0010*

(*p < .01, **p < .05)

While other data were collected and analysed the three sets of data shown in Tables 1 - 3 are revealing for the information they provide concerning places differences. The initial analysis provided evidence of several differences between the seven groups. Statistically significant differences were established for all variables related to thinking skills ($p < .01$), surface, achieving ($p < .01$) and deep ($p < .05$) strategies on the *Learning Process Questionnaire*, and Factor 3 ($p < .01$) and Factor 1 ($p < .05$) from the semantic differential items (see Tables 1, 2 & 3).

These data were signs that supported the central hypothesis that place may influence thinking and learning behaviour. Place specific data revealed some patterns in the differences. For example, it was noted that spatial ability was superior for the two 'rural' Places A and B when compared with the other groups of adolescents from 'urban' Places D, E, F and G (see Test 5, Table 1). Places A and B also had the highest mean scores on related written tasks (see Tasks 1-3, Table 1). There appeared to be a strong connection between outcome and background experience of place and when related to travel experience and other aspects of personal behaviour, such as leisure activities and preferences, a set of images emerged which distinguished 'place' from socioeconomic status and general reasoning ability.

Some parallels between groups were expected. Similar results from the rural places could be predicted due to the similarity in social structures in each community. The two urban 'rich' Places D and E were expected to show similarities as were the two urban 'poor' Places F and G. The mining community, Place C appeared to be exempt from these comparisons, although there were possible comparisons with the rural and urban poor places. This latter connection proved to be the case when the places were statistically analysed according to these three major groupings. Table 4 shows analyses of variance of places grouped as follows: Places A, B represented by Group 1, Places D and E represented by Group 2 and Places F, G, and C represented by Group 3.

Significant differences existed for all thinking skills variables ($p < .001$) and the three learning process scales of surface motive, surface strategy, and achievement motive. The differences verified the hypothesised grouping. Confidence in the outcome was also raised by the knowledge that the presence of these differences was based on such wide ranging information. Adolescents from similar places appeared to share learning and thinking behaviour patterns. As predicted, the analyses showed the unique qualities of each place. Against the background knowledge of the complexities associated with the task this could have been interpreted as a chance finding. However, when there remained statistically significant differences between places, grouped for similarities, there appeared less reason to doubt that place was the phenomenon being measured. Based on the assumption that similar experiences of interactions between people and place will encourage shared meanings, the general research hypothesis that place will influence the thinking skills of adolescents appeared to have substantial support.

Table 4: Analysis of variance results: Groups 1-3 Learning Process Questionnaire scales and thinking skills

Variable	df	F value	p < 1
Surface motive	6	1.71	.0178**
Surface strategy	6	3.01	.0076*
Deep motive	6	1.51	.2143
Deep strategy	6	2.34	.7344
Achieving motive	6	1.70	.0269**
Achieving strategy	6	3.91	.0551
IQ	6	15.97	.0001*
Test 5	6	63.83	.0002*
Task 1	6	7.64	.0001*
Task 2	6	11.41	.0001*
Task 3	6	7.08	.0001*
Test 10	6	7.27	.0001*
Test 11	6	6.61	.0001*
Test 12	6	7.74	.0001*
Test 13	6	3.25	.0001*
Test 14	6	11.71	.0001*
		($*p < .01, **p < .05$)	

Discussion

One of the observations that may be made from the data for Study Two is that the visual acuity of adolescents appears enhanced in places where the community is small and able to provide a variety of learning opportunities. Adolescents from both rural communities scored highest on spatial-visual tasks with no direct relationship to general reasoning ability. Conversely adolescents from 'wealthy' well-travelled backgrounds had relatively poor performances on the same variables, thus raising questions about prior assumptions regarding the value of such experiences for broadening concept knowledge and flexibility of thinking. The kinds of experiences appeared to be more important prerequisites for flexible, field-independent thinking than long distance travel to foreign places. One hypothesis is that diverse multi-sensory experiences will assist the development of visual-spatial thinking. Travel to far away locations may, ironically perhaps, broaden knowledge of distant places but

provide sameness in experience whereas leisure pursuits such as fishing, surfing, and bush walking may stimulate many more senses and skills.

Further varied evidence suggested that community attitudes influence perceptions and attitudes. They may explain differences in learning approaches: both strategies and motives. For example the data show that adolescents within the 'poor' urban places were strong on 'surface' learning approaches and strategies and while they had comparable motives for 'deep' and 'achieving' approaches their strategies for these scales were less well developed than for adolescents at other places. By contrast within one 'wealthy' place where students and parents had declared high expectations tertiary education and related careers, the scores were highest on the 'achieving' scales and weakest on the 'surface' scales. In both examples there was evidence to suggest that the teaching methods reinforced what appeared to be the predominant attitude of the community or neighbourhood.

Differences in thinking skills, concept knowledge, attitudes towards leisure activities, perceptions of travel and other places, and learning approaches form part of the profile that distinguished the groups of adolescents from places selected for the study. The variables studied also revealed interesting differences that are place specific but perhaps best explained by adolescent development.

Shared Adolescent Behaviour

Parallelling findings of the small group of active researchers in this field (Silbereisen & Eyferth, 1986; Van Vliet, 1983), adolescents in Studies One and Two revealed common perceptions through orientations towards the environment, and preferences regarding friendships and privacy. These dimensions were not seen as conflicting with the evidence regarding place differences where some aspects were manifestly present in different ways. Rather, the outcomes were complementary and indicative of the complexities involved in isolating the nature of the numerous influences on behaviour. The leisure preferences for 'staying at home' of some groups and for 'going away' of others, for instance, were seen as symbolic of the need for privacy. For some adolescents, 'home' does not enable much personal space whereas others live in families where there is ample space. From one perspective, this can be viewed as a place difference. Alternatively, the differences in behaviour could be regarded as expressions of the same phenomenon. Studies One and Two provided a number of views on shared and place specific adolescent behaviour. Again, the value of such a widely based approach to data collection was useful for identifying differences in behaviour and for providing a reasonable explanation of their possible sources.

Conclusion

The eclectic approach taken with Studies One and Two was considered important for the research findings. The resultant data have provided a mass of findings that are widely divergent in their possibilities for future research. A narrow focus in the beginning would not have served this purpose well and would have limited the potential for 'discovery'. At the same time, it is conceded that the somewhat potpourri approach taken may diminish confidence placed in the data from variables included because of their interactive role with the total pattern. For some findings, there is perhaps not the depth of data for conclusive comment. Breadth may have been at the expense of depth. As Ittelson (1973) explains, environments "surround",

"are always multi modal", "provide more information than can possibly be processed", they "call forth actions [and] always have an ambience" (pp.13-14). To study environmental perception adequately the observer must become a participant. The field is inherently "affective" (Ittelson, 1973). In Study One the observer was, in part, a participant. The findings from this construct validation process provided the incentive to proceed with Study Two as planned. The latter combined both qualitative and quantitative data gathering techniques based on a conviction that a wide approach may provide a composite picture that strengthens the findings from individual variables. Studies One and Two were intended to be exploratory. Evidence of statistically significant differences in environmental perceptions among four contrasting places was recorded for Study One. Statistically significant differences among seven contrasting places were recorded in thinking skills, attitudes towards travel and learning and study approaches for Study Two. These findings provide support for the hypothesis that place of residence, especially during early developmental years, can influence cognitive processing and help shape behavioural attitudes.

From a methodological perspective the investigation has provided some directions for further research into the interactions between people and places including: the connection between visual-spatial competence and environmental experiences including a possible relationship between field independence and environmental experience; the influence of neighbourhood values and learning approaches, and in broad terms what may be described as the nature of 'out of-school' learning.

As a final comment it seems worthwhile reflecting on Tuan's descriptive analysis of *topophilia*, the emotion of sentimental attachment that travellers feel when returning to the place of their youth. This feeling is more than aesthetic in influence. Conceivably, it generates thinking skills as well as attitudes and perceptions that are inextricably, if not irreversibly, bound to place. For educators and psychologists questions regarding experience and prior knowledge may best be approached holistically by looking beyond institutions to the wider community of people - place interactions.

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RATIONALISING RESEARCH APPROACHES

Michael Naish

Abstract

There is much discussion of the pros and cons of various research styles or approaches. This discussion frequently displays an emotional tone, where a rational approach is more appropriate. Decisions about the use of appropriate research approaches should be based on the answers to a number of key questions about the research. The range of styles and approaches should be complementary rather than in competition. It boils down yet again to a question of achieving balance in educational matters.

Emotions and politics in geography education research

It is intriguing, at least for this writer, to notice the somewhat emotional manner in which some authors address discussion of alternative research styles and approaches. Where a researcher decides to use qualitative or illuminative approaches, for example, it is common to find an extensive justification for this in the body of the research report. It is as if she or he felt that using such approaches required explanation and justification - almost an apology in some cases.

In 1985, Robert G. Burgess commented that the previous decade had seen a movement from research concerned with "indicators, variables and measurements", undertaken by the use of surveys and quantitative techniques, towards more qualitative methods, concerned with approaches that were claimed to be "'soft' and 'non-rigorous', compared with the 'hard', 'objective', 'rigorous' approaches that are referred to as quantitative methods" (Burgess 1985). It was noted at a symposium focused on the analysis of quantitative data, that even delegates who made use of qualitative approaches had taken on much of the terminology used by those who, as Burgess puts it, "make abusive remarks" about qualitative methodology (op. cit., p. 1).

Halfpenny (1979) made a note of the terms employed to distinguish between qualitative and quantitative approaches at that symposium. A list of the terms is given in Figure 1. The notion of research being 'wet' or 'dry' is quite interesting, I think. One is not sure whether it is concerned with swimming, or, perhaps art education.

I certainly experienced the emotional dimension of this matter myself, when my attempts to raise funding for a national curriculum development project were almost thwarted by a chairman of the research committee of the institution where I was working at the time. At an important meeting, he argued that the institution should not support the proposal because it was not 'pure' research. There were to be no experimental and control groups and no very sophisticated quantitative treatment of data produced in controlled experimental situations. It was actually to be about developing the nature and quality of experience gained by students and teachers

QUALITATIVE	QUANTITATIVE
soft	hard
dry	wet
flexible/fluid	fixed
grounded	abstract
descriptive/exploratory	explanatory
pre-scientific	scientific
subjective	objective
inductive	deductive
speculative/illustrative	hypothesis testing
political	value-free
non-rigorous	rigorous
idiographic	nomothetic
holistic	atomistic
interpretivist	positivist
exposes actor's meanings	imposes sociological theory
phenomenological	empiricist/behaviourist
relativistic	universalistic
case-study	survey
good	bad
bad	good

Figure 1

working on geography courses for 16-19 year-olds, but it was not 'pure' research. Fortunately the chairman's mind was changed by a colleague who happened to be at that meeting and who understood the nature of the large scale action research endeavour which I was proposing.

Continuing with this exposure of the emotional nature of much of the feeling, talking and writing about research approaches, I find the following quotation from Jean McNiff's book particularly significant (McNiff 1988),

"I feel that teachers are being misled by a view of controlled educational research. They are led to believe that, in order to qualify as a legitimate research proposal the field should not be of the 'ordinary' variety; that the researcher will have to set up an experimental situation and compare it with a 'normal' one; that she will have to quantify her findings; that all this will be conducted in an 'objective' fashion which will probably not make room for her own creativity; that in order to do her research, she will have to consult a university or other institution. Such a structured framework was indeed the view of the discredited 'disciplines' approach whose apparent inability to deal with such issues has given rise to the present crisis in educational theory. In this view educational research was split into its contributory disciplines of

philosophy, psychology, sociology and history. Research in this tradition tended to be done on other people, rather than in a collaborative enquiry with them. Teachers' hopes of coming to grips with their everyday practical class problems were being deceived by the current insistence on this being the only acceptable view of research. Such an approach is clearly incapable of answering the commonplace, fundamentally crucial questions of 'How am I going to cope in tomorrow's lessons?' 'How am I going to improve the process of education for myself and my children?' 'Why am I failing?' "(McNiff, 1988, pp.xv,xvi).

Jean McNiff goes on to note the growing dissatisfaction and frustration at the grass roots level of the teaching profession with the traditional model, which had, she suggests, been dominant during the 1960's and 1970's, but was, during the 1980's, beginning to fall into decline. For her, an increasingly popular candidate to provide a coherent alternative, appeared to be action research.

One reason for the strong emotional overtones of discussions and decisions about research approaches is the political nature of research as an activity. There are many dimensions to this. To work for and gain funding, for example, is an intensely political activity. To be successful at it, one has to win minds and influence people. Funding bodies can be very selective in their grant making. Thus they have the power too to win minds and influence people! They can, in effect, act as some kind of censor of public knowledge. When the funding body is linked to an overtly political body or institution, such as, for example, the party in power, then the potential of this censorial role becomes particularly significant.

Public reporting of research findings may also be affected by political motivation and used for political ends. Reporting in the media in the UK in recent years has been especially questionable with respect to educational research. Reports may be as influential for the information they leave out as for that which they include. League tables based on the results of tests to assess children's achievement, or on public examinations provide a basic form of survey research. When these are published without reference to variation in the socio-economic background of the students, there are clearly important questions to be asked about the value of the tables and about the motives for publishing them in such a condition.

The very debate about research approaches can be seen too, as having political underpinning. I turn to Jean McNiff again, for a significant quotation,

"It is evident from this very brief survey (of action research as an educational tradition) that action research can offer a devolution of power from the universities to the classroom, from the external researcher to the teacher as researcher".

The growth in popularity of qualitative approaches, and, in particular, of action research, can indeed be seen as a way of shifting power from the traditional institutions towards the practising teacher. The power of 'pure', 'objective', 'scientific' empirical research with its quantitative, statistical mystique can be seen as threatening to the professional teacher, who is concerned fundamentally with improving practice. The growing popularity of school based action research is symptomatic of a wider political movement to divorce the schools from the university links. For some, such links are viewed as a constraint: for others the links are seen as a trendy diversion. In Britain, the movement generated by the government to base initial teacher training in schools with no links with higher education is another

dimension of this wider political trend.

In practice, there is no reason why good action research, or good qualitative educational research in general, should not be carried out under the auspices of higher education. Teachers who wish to undertake action research may well feel the need for the stimulus and support of the higher education specialist. From the point of view of those who see action research as the political means to achieving independence from the universities, that last statement is, of course, anathema. It may well be that the best possible scenario would be where there is a working partnership between the school based teacher as researcher and the institution of higher education. Indeed, some recent dissertations undertaken by teachers working towards the MA in Geography Education at the University of London Institute of Education exemplify this very well. As is so often the case in the field of education, it is all a question of balance.

A rational approach to decisions about research style

So far in this paper I have been discussing the emotional dimension of decisions about research style or approach and the way in which this is linked to the political business of power distribution within the educational system. What is likely to be far more productive is a rational approach to decision making about the selection of an appropriate research style or approach. Any particular research approach may have value, when it is appropriately employed. Appropriate employment will depend on the answers to a set of significant questions about the nature of the research (Bastiani and Tolley, no date given).

Researchers should, at an early stage in thinking about a research project, begin to ask themselves the kinds of questions which will help them to identify, clarify and refine the research problem. The problem itself may helpfully be posed in the form of a question. Some obvious questions to ask are:
- what is the general nature of my interest? Is it, for example, about improving classroom practice in my geography teaching, or about discovering how widespread is a certain phenomenon such as the use of IT in geography lessons, or how to approach the problem of reducing prejudice amongst fourteen year-old students when studying Third World issues, or whatever?
- what is the general form of my interest? Am I, for example, interested in portraying a situation, or comparing conditions and situations, or evaluating an innovation, or developing new curricula, or surveying practice? It is clear, at this early stage, that the form of the interest may well influence the style of research selected, since a different style would be required to 'portray a situation' from that appropriate to 'surveying practice'.
- what is the precise nature of the problem, issue or question I want to find out about? Here the would-be researcher should look in more precise detail into the exact nature of the question to be addressed.
- who might be interested in my results? The researcher should consider the possible audience for the research. If the audience is restricted to colleagues in the same school, informal reporting of findings may be appropriate, while if a wider audience is envisaged, a more formal written report may be required.

Raising and answering questions such as the above should help the researcher to clarify what it is exactly that she or he wishes to research. The next stage is to

develop an appropriate methodology and style and here again, the researcher should pose a series of questions such as:

- what will be the scale of my study, on the range from study of an individual person, through small Groups, the classroom, the school or institution, to regional, national or international scales? One could usefully consider the range of scales commonly employed by geographers, from micro-, through meso- to macro-scales here.

  Consideration of scale of study will necessarily influence the research approach or style, since it is difficult to undertake illuminative work on anything but the small scale, while it is possible to sample from the whole population when studying at a large scale, using quantitative approaches.

- what kinds of evidence shall I require to be able to address my focus questions? Shall I need, for example, subjective accounts, printed secondary material, documentary evidence such as video or audio tape, systematised observational data, data from questionnaires and/or interviews, standardised tests? Again, consideration of this question pushes one towards certain approaches and styles which are appropriate to the question to be researched.

- what methodology will be necessary to attempt to answer the focus research questions I am posing? Should I, for example, be using a survey method, a case study approach, an action research mode, an evaluation study, a strategic study concerned with the process of change, or is my question more appropriately approached through a philosophical analysis backed up by library research? For an historical analysis, historical research methods will obviously be appropriate.

Consideration of these questions will help clarify the style of research which is being undertaken and this, as we have tended to assume throughout this paper, may be placed on a dimension, from quantitative/empiricist at one end of the range to qualitative/interpretative at the other. In practice there is no reason why the whole of the research should be firmly at one end of the dimension or the other. Some good research may be difficult to locate on the dimension, because it uses elements of a range of style and approaches as they are relevant to particular phases of research or to the precise question being addressed at any given time.

Conclusion

Aficionados of the action research movement are much disposed towards calling on the support of Jurgen Habermas (Habermas 1972, 1979) in justifying the approach adopted. Jean McNiff, for example, shows how, as part of his theory of social communication, Habermas identified four significant criteria, which, assuming they are agreed by the parties engaged in communication, "will ensure the validity of that communication. The criteria are:

1. that a statement is true;
2. that the speech act is comprehensible;
3. that the speaker is authentic;
4. that the situation is appropriate for these things to be said."

(McNiff, op.cit., p. 134).

I suppose that we should be looking for such qualities in all research - that it should be true, comprehensible, authentic and appropriate. This last is particularly important when it comes to the question of research style and approach. The style and approach

should, fundamentally, be appropriate to the questions being researched, the reasons why these questions are being researched and the audience for whom the findings are intended. A rational approach to analysing these points should be the basis on which decisions about approach and style are taken.

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