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Editorial Board

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The Direct Teaching of Thinking as a Skill

Edward de Bono

The teaching of thinking as a skill is not tomorrow's dream but today's reality, claims one of the world's foremost experts on the topic. He describes his methods for teaching "the generalizable skill of thinking" - methods that have been used from the jungles of South America to the boardrooms of major corporations.

A major trend may be developing in education toward the direct teaching of thinking as a skill. I intend in this article to answer two basic questions related to this trend. First, what is thinking? And second, how can we teach thinking directly? My answers spring from 16 years of experience in the field. During this time I developed an instructional program on thinking skills that is now used by several million schoolchildren in many different countries and cultures.

Of course, some educators believe that thinking is simply a matter of innate intelligence. Two corollaries follow from this belief: 1) we do not have to do anything specific to help highly intelligent individuals learn how to think, and 2) there is little we can do to help less intelligent individuals learn how to think. Thus those who hold this belief rest content. Yet many highly intelligent individuals often seem to be rather ineffective thinkers. Such people are often good at reactive thinking and puzzle solving — but less able to think about topics that require a broader view. They may show cleverness, but not wisdom.

I prefer to see the relationship between intelligence and thinking as similar to the relationship between a car and its driver. Engineering determines the innate potential of the car, but the skill with which the car is driven must be learned and practiced. Thus I would define thinking as "the operating skill with which intelligence acts upon experience."

What, then, is the relationship of information to thinking? It seems obvious to me that God can neither think nor have a sense of humor. Perfect knowledge precludes the need to move from one arrangement of knowledge to a better one. Thus perfect knowledge makes thinking unnecessary. Nonetheless, educators often seem to believe that we can attain such perfect knowledge. However, even if it were possible to absorb perfect knowledge about the past, we can only have very partial knowledge about the future. Yet, as soon as

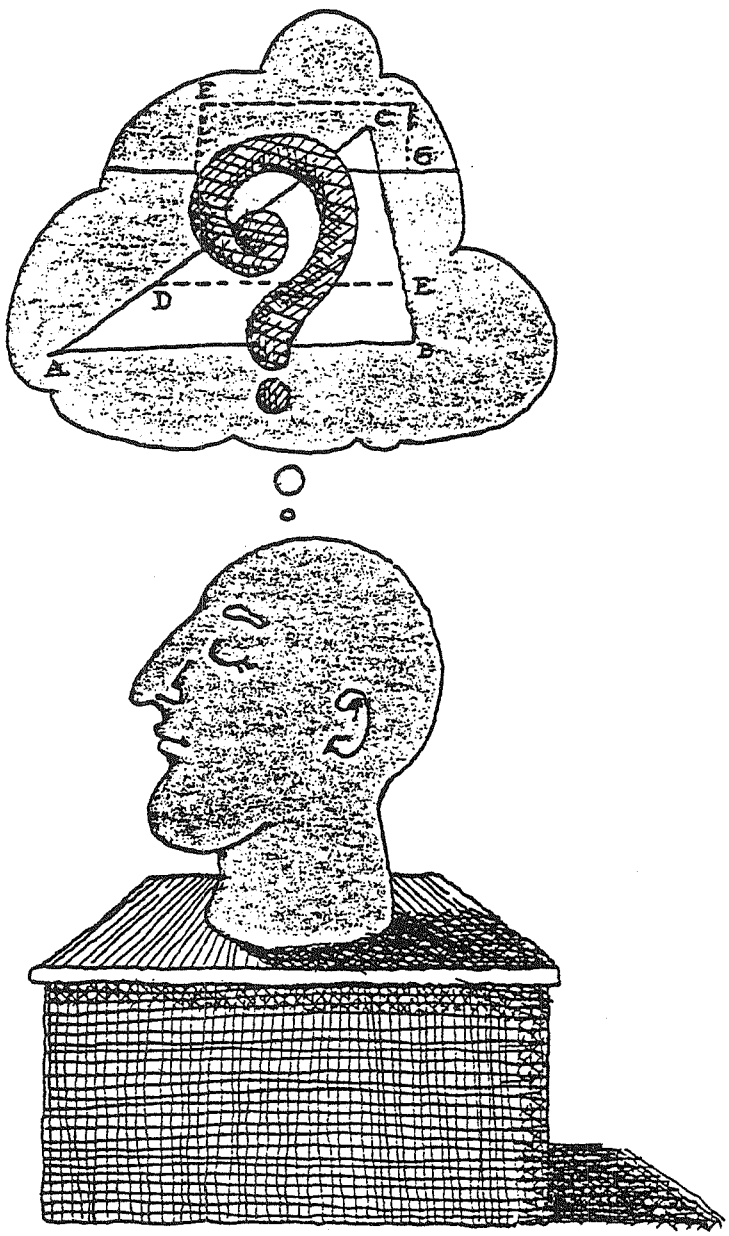


Illustration by Andrea Eberbach

a youngster leaves school, he or she will be operating in the future. Every initiative, decision, or plan will be carried out in the future and thus will require thinking, not just the sorting and re-sorting of knowledge. I have coined the term "operacy" to stand alongside literacy and numeracy as a primary goal of education. Operacy is the skill of doing things, of making things happen. The type of thinking that my program (which I will describe later) teaches is very much concerned with operacy.

In short, information is no substitute for thinking, and thinking is no substitute for information. The dilemma is that there is never enough time to teach all the information that could usefully be taught. Yet we may have to reduce the time we spend teaching information, in order to focus instead on the direct teaching of thinking skills.

The relationship between logic and thinking is likewise not a linear one. The computer world has a saying, "Garbage in — garbage out." In other words, even if the computer is working flawlessly, this will not validate a given outcome. Bad logic makes for bad thinking, but good logic (like the flawless computer) does not insure good thinking. Every logician knows that a conclusion is only as good as the premises. Mathematics, logic (of various sorts), and — increasingly — data processing are excellent service tools. But the deeper we advance into the computer age, the greater the need to emphasize the perceptual side of thinking, which these tool serve.

Meanwhile, emotions, values, and feelings influence thinking at three stages. We may feel a strong emotion (e.g. fear, anger, hatred) even before we encounter a situation. That emotion channels our perceptions. More usually, there is a brief period of undirected perception, untill we recognize the situation. This recognition triggers emotion, which thereafter channels perception. The trained thinker should be operating in the third mode: perception explores the situation as broadly as possible, and, in the end, emotions determine the decision. There is no contradiction at all between emotions and thinking. The purpose of thinking is to arrange the world so that our emotions can be applied in a valuable manner.

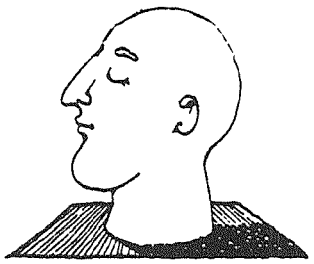
The relationship of perception to thinking is, to my mind, the crucial area. In the past, far too many of our approaches to thinking (e.g., mathematics, logic) have concerned themselves with the "processing" aspect. We are rather good at processing but poor in the perceptual area.

We may have to reduce the time we spend teaching information, in order to focus instead on the direct teaching of thinking skills.

What do I mean by perception? Quite simply, the way our minds make sense of the world around us. Language is a reflection of our traditional perceptions (as distinct from the moment-to-moment ones). Understanding how perception works is not so easy. But this is a crucial point — one that has a direct effect on the way we teach thinking.

Imagine a man holding a small block of wood. He releases the wood, and it falls to the ground. When he releases it a second time, the wood moves upward. This is strange and mysterious behavior. The third time he releases the wood, it remains exactly where it is — suspended in space. This is also mysterious behavior. If I were now to reveal that, in the second instance, the man was standing at the bottom of a swimming pool, then it seems perfectly natural for the wood to float upward. In the third instance, the man is an astronaut in orbit; thus it is perfectly natural for the wood to remain suspended, since it is weightless. Behavior that seemed strange and unaccountable suddenly seems normal and logical — once we have defined the "universe" in which it is taking place.

The traditional universe of information handling is a "passive" one. We record information through marks on paper or marks on magnetic tape. We can handle and process that information. The marks on the surface of the paper or tape and the information itself do not alter, unless we alter them.



It is possible to establish both habits of mind and specific thinking techniques that can be applied in any subject area.

An "active system is totally different; here, the information actually organizes itself into patterns. We human beings have self-organizing information systems. I first wrote about them in 1969 in my book, *The Mechanism of Mind.*[1] I showed then how such systems work, and I suggested how the structure of a nerve network would produce such patter-making effects. My hypothesis has since been simulated by computer, and the nerve network functions substantially as I had suggested.[2] In the world of information handling, the concept of self-organizing information systems is now coming to the fore.[3] Such systems are quite different from our usual computers.

Once we enter the "universe" of active, self-organizing systems, then the behavior of such things as perception and creativity becomes quite clear. The processes are no longer mysterious. Just as happened with the block of wood, phenomena that seemed to be unaccountable are suddenly seen to be explicable — once we have identified the appropriate universe.

The function of self-organizing system is to allow incoming experience to organize itself into patterns. We could loosely compare these patterns to the streets in a town. The self-organizing system is immensely efficient; it allows us to get up in the morning, cross a road, recognize friends, read and write. Without such a pattern-making and pattern-using system, we would spend about a month just in crossing a road.

However, the advantages of a patterning system are also its disadvantages. "Point-to-point thinking" is a good example. In this kind of thinking, we follow a pattern from one point to the next — and then follow the dominant pattern from that next point onward. In an experiment that I conducted jointly with the Inner London Education Authority,[4] I asked 24 groups of 11-year-olds to discuss the suggestion that 'bread, fish, and milk should be free." Although many of the children came from deprived backgrounds, 23 of the 24 groups opposed the idea of free bread, fish, and milk. The point-to-point thinking that led to this stand went as follows: 1) the shops would be crowded; 2) the buses going to the shops would be crowded; 3) the bus drivers would demand more money; 4) the drivers would not get more money, and they would go on strike; 5) other people would go on strike as well; and 6) there would be chaos — so giving away bread, fish, and milk is a bad idea. Thus can point-to-point thinking lead us astray, as we miss the forest while fixating on the trees.

However, direct teaching of thinking can offset the disadvantages of a patterning system. At the end of a pilot project on the teaching of thinking in Venezuelan schools, for example, we held a press conference. A journalist attending that conference claimed that all attempts to teach thinking are really a form of brainwashing in western capitalist values. The journalist happened to be wearing spectacles. So I removed her spectacles and asked what she used them for. She told me that she used the spectacles in order to see things more clearly. I then explained that the perceptual tools we were teaching in the lessons on thinking served the same purpose. The tools enable youngsters to scan their experiences so that they can see things more clearly and more broadly. A better map of the world is the result. These thinkers can still retain their original values and choices, however. Giving spectacles to nearsighted individuals enable them to see three glasses on a table — containing wine, orange juice, and milk. The individuals still exercise choice as to which drink each prefers. In the same way, our instructional program cuts across cultures and ideologies. The program is used in industrialized nations, such as Canada and Great Britain, and in developing nations, such as Venezuela and Malaysia; it will soon be used in Cuba, China, and Bulgaria — as well as in Catholic Ireland.

My point is that, in terms of perception, we need to achieve two things: 1) the ability to see things more clearly and more broadly and 2) the ability to see things differently (i.e. creativity or "lateral thinking"[5]). As I have said, perception takes place in an "active" information system. Such systems allow experience to organize itself into

immensely useful patterns, without which life would be impossible. But, as I said above, the very advantages of the patterning system are also its disadvantages. We must overcome these disadvantages and improve perception in two ways: in breadth and in creativity or lateral thinking (both of which fall under the heading of "change").

Let me turn now to the second question that I posed at the beginning of this article. How can we teach thinking as a skill? Such teaching is going on right now; it is not tomorrow's dream, but today's reality. Millions of children are involved. In Venezuela, for example, 106,00 teachers have been trained to use my program, and every schoolchild takes a course in thinking. By law, Venezuela, for example, 106,000 teachers have have two hours of direct instruction per week in thinking skills. The contracts of some labor union members in Venezuela specify that their employers must make provisions to teach them thinking skills. My program is also in use in many other countries — including Australia, the U.S., and Israel, as well as those nations I have mentioned previously.

The program of which I speak is called CoRT. (The acronym stands for Cognitive Research Trust, located in Cambridge, England.) I have already outlined the theoretical foundation for the design of this program. The lessons themselves focus on the perceptual aspect of thinking. The design of the tools takes into account the behavior of self-organizing paterning systems.

The design criteria for a practical instructional program should include the following elements.

- The program should be usable by teachers who represent a wide range of teaching talents, not just by the highly gifted or the highly qualified. (The 106,000 Venezuelan teachers were not all geniuses.)

- The program should not require complicated teacher training, since it is difficult to generalize such programs. (The CoRT program can be used by teachers with no special training or with only simple training.)

- The program should be robust enough to resist damage as it is passed along from trainer to trainer — and thence from new trainer to teachers and, finally, to pupils.

- The program should employ parallel design so that, if some parts of the program are badly taught and other parts are skipped or later fogotten, what remains is usable and valuable in its own right. (This contrasts with hierarchical design, in which a student must grasp a basic concept before moving on the next concept layer; failure at any concept layer in a program of this type makes the whole system unworkable.)

- The program should be enjoyable for both teachers and youngsters.

- The program should focus on thinking skills that help a learner to function better in his or her life outside of school, not merely to become more proficient at solving puzzles or playing games.

Before considering ways of teaching thinking, we must confront a prior question: Should thinking be taught in its own right? Certain practical considerations affect the answer to this question. For example, there are no gaps in the school schedule as it now exists. Thus it seems to make more sense to insert thinking skills into an existing subject area. English makes a good home, because a natural synergy exists between thinking and the expression of thought in language. In addition, the teaching style is often more open-ended in English classes than in some other subject areas. However, the CoRT program has been used effectively by science teachers, by music teachers, and even by physical education teachers.

Despite these practical considerations, I believe that we should have a specific place in the curriculum that is set aside for the teaching of thinking skills. This formal recognition is essential so that pupils, teachers, and parents all recognize that thinking skills are being taught directly. In time, I would certainly hope that the skills taught in the "thinking lessons" would find their ways into such subject areas as geography, history, social studies, and science. However, the first step is to establish "thinking" as a subject in its own right.

Having dealt with this question, we can now look at some of the traditional approaches to the teaching of thinking:

- *Logic, mathematics, and data processing.* These are very important subjects, but they concern themselves with processing, not with the perceptual side of thinking. The better that students become at processing, the more they need to strengthen their perception.

- *Critical thinking.* This is a popular approach because it is traditional. It also employs a relatively easy teaching method (the spotting of faults). This approach has only limited value, however. The spotting of faults — regardless of its usefulness in debate or argument — is only one spect of thinking. The approach includes no generative, constructive, or creative elements. The avoidance of faults does not improve one's ability to plan or to make decisions. The avoidance of faults is, to my mind, an aspect of thinking that has traditionally been overvalued.

Thinking is best taught to youngsters in the middle grades. They really enjoy thinking, and their motivation is very high

• *Discussion.* Directly or indirectly, discussion must be the most widely used method of teaching thinking. Youngsters are asked to discuss (or write essays on) a subject. The aim is to provide practice in thinking. The teacher notes and comments on faults and inappropriate uses of evidence, hoping that students will extract from these clues some general principles of thinking, which they will then use in future, unrelated situations. In reality, relatively little transfer of thinking skills from one situation to another takes place.

• *Puzzles, games, and simulations.* I have used games and problems as motivators, to get people interested in thinking. However, because of the difficulty of transfer, I do not believe that such devices have much teaching value. A skillful chess player does not transfer to his or her everyday life the fine sense of strategy developed through playing this game. A youngster may develop a puzzle-solving method, but thinking does not seem to proceed in that same fashion in real life. I have grave reservations about the traditional information-processing model of thinking, which seems more a description than a system of operating.

This brings me to the central problem: transfer and content. Does a generalizable skill of thinking exist? Many theorists think not. They believe instead that there is thinking in mathematics, thinking in science, and thinking in history — but that in each case the rules are different, just as the rules for Monopoly differ from those for chess. I do not see this as a point of view with which I must either agree or disagree totally. Clearly, subject idioms exist. Nevertheless, it is possible to establish both habits of mind and specific thinking techniques that can be applied in any subject area. For example, the willingness to look for alternatives is a generalizable thinking habit. And deliberate provocation is a technique that can be applied to generate ideas in any situation.

Because we cannot succeed in teaching generalizable thinking skills through the use of specific content materials, some theorists believe that such skills cannot exist. But there is another way of looking at this situation: the view that generalizable thinking skills exist but cannot be taught using specific content. My experience has led me to the latter viw. As I have already noted with regard to "discussion method" of teaching thinking skills, little transfer of such skills seems to take place from one situation to another. Given the mechanics of perception and attention, this is hardly surprising. If the subject of a discussion is interesting, then — by definition — attention is not focused on the metacognitive level; that is, participants are not thinking about the *thinking* that they are using to discuss the subject. Moreover, it is very diffcult to transfer a complex action sequence from one situation to another. That is why the CoRT program deliberately focuses on "tools" that can be transferred.

I have noticed among U.S. educators a tendency to try to teach thinking through content materials. This approach seems — to its proponents — to have two merits. First, this approach makes it easier to introduce thinking into the curriculum, because the material must be covered anyway (and it is already familiar to the teacher). Second, this approach seems to be killing two birds with one stone: teaching thinking *and* teaching content. But this approach is not effective. I am afraid that the nettle must be grasped. Either one wishes to teach thinking effectively or merely to make a token gesture. Attending to content distracts from attending to the thinking tools being used. Theory predicts this outcome: you cannot build meta-patterns on one level and experience patterns on another level at the same time. Experience backs up this expectation. Wherever there has been an attempt to teach thinking skills and content together, the training in thinking seems to be weaker than when those skills are taught in isolation.

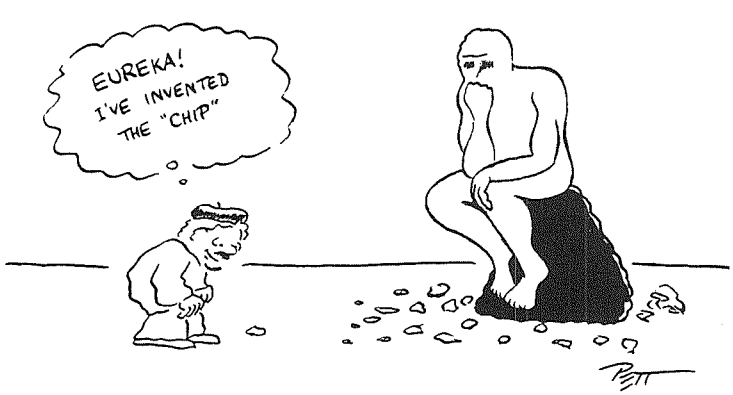
So what is the CoRT method? It is best to illustrate this method with an example.

I was teaching a class of 30 boys, all 11 years of age, in Sydney, Australia. I asked if they would each like to be given $5 a week for coming to school. All 30 thought this was a fine idea. "We could buy sweets or chewing gum.... We could buy comics.... We could get toys without having to ask Mum or Dad."

I then introduced and explained a simple tool called the PMI (which I will describe later). The explanation took about four minutes. In groups of five, the boys applied the PMI tool to the suggestion that they should be given $5 a week for coming to school. For three to four minutes they talked and thought on their own. At not time did I interfere. I never discussed the $5 suggestion, other than to state it. I did not suggest that the youngsters consider this, think of that, and so forth. At the end of their thinking time, the groups reported back to me: "The bigger boys would beat us up and take the money.... The school would raise its charges for meals.... Our parents would not buy us presents.... Who would decide how much money different ages receive?... There would be less money to pay teachers.... There would be less money for a school minibus."

When they had finished their reports, I again asked the boys to express their views on the suggestion of pay for attending school. This time, 29 of the 30 had completely reversed their opinion and thought it a bad idea. We subsequently learned that the one holdout received *no* pocket money at home. The important point is that my contribution was minimal. I did not interact with the boys. I simply explained the PMI tool, and the boys then used it on their own — as *their* tool. My "superior" intelligence and broader experiences were not influences. The boys did their own thinking.

The PMI is a simple scanning tool designed to avoid the point-to-point thinking that I mentioned earlier. The thinker looks first in the *P*lus direction (good points), and then in the *M*inus direction (bad points), and finally in the *I*nteresting direction (interesting things that might arise or are worth noting, even if they are neither good or bad). Each direction is scanned formally, one after another. This formal scan produces a better and broader map. Thinking is used to explore, not merely to back up a snap judgement. The thinker then applies judgement to the better map. The PMI is the first of the 60 CoRT lessons.



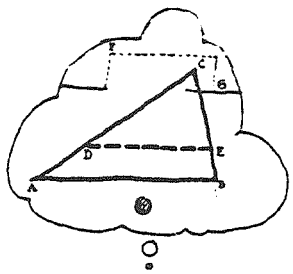
For the rest of this particular lesson on thinking, I might have asked the boys to apply the PMI in various ways (e.g., one group doing only "Plus" or "Minus" or "Interesting") to a number of thinking items, such as: Should all cars be colored yellow? Would it be a good idea for everyone to wear a badge showing his or her mood at the moment? Is homework a good idea? Note that the items are not related. Moreover, the groups would be allowed to spend only two to three minutes on each. This is quite deliberate and essential to the method.

The items are switched rapidly so that attention stays on the PMI tool and *not on the content.* Once skill in the use of the tool is developed, students can apply the PMI to other situations in other settings. One girl told us how she used the PMI at home to decide whether or not to have her long hair cut. Some children report that they have used the PMI with their parents, in discussing such major decisions as moving to a new town or buying a car. This is the sort of transfer that the CoRT program aims to achieve.

The PMI is a scanning tool, not a judgement tool. If a thinker spots 10 "Plus" points and only two "Minus" points, this does not necessarily mean that the idea is a good one. Like all scanning, the PMI is subjective, depending on the thinker's perspective. One boy said, as a "Plus" point, that yellow cars would be kept cleaner. Another boy stated this as "Minus" point — because he had to clean his dad's car and would therefore have to perform this chore more often. Both were right.

The PMI is designed to be artificial, memorable, and easy to pronounce. At first, some teachers rejected "PMI" as pointless jargon. They preferred to encourage or exhort the youngsters to look at the good points and the bad points in any situation. The youngsters probably did so — at that moment. However, without the artificial term "PMI" crystallize the process and to create a meta-pattern, the exhortation does not stick. One teacher told me how he had used the term "PMI" and how his colleague, in a parallel lesson, had used exhortation. His colleague was soon convinced of the value of the term "PMI."

One girl said that she initially thought the PMI a rather silly device, since she knew how she felt about a subject. But she noted that, as she wrote things down under each letter (she was doing a written exercise instead of the usual oral approach), she became less certain. In the end, the points she had written down did cause her to change her mind. Yet *she* had written down the points. That is precisely the purpose of a scanning tool.



Perhaps the most important aspect of direct teaching of thinking as a skill is the self-image of a youngster as a "thinker." Such value images are self-reinforcing.

It is important to realize that the description of thinking and the design of tools are two totally different things. It is possible to describe the process of thinking and to break it into components. But then one is tempted to turn each component into a tool, on the premise that, if the components are taught, thinking skills must surely be enhanced. However, teaching someone how to describe a flower does not teach him or her how to grow a flower. The purpose of analysis and the purpose of an operating tool are separate and distinct.

The CoRT tools are designed specifically as operating tools. Such design has two components: 1) the tool must be easy to use, and 2) it must have useful effect. Abstract analyses and subdivisions of the thinking process may be intellectually neat, but this does not guarantee usability or effectiveness. My many years of experience, working with thousands of executives and organizations in different countries, have given me some insight into those aspects of thinking that have practical value. I have also worked with scientists, designers, lawyers, and many others who are involved in the "action world" of thinking, as distinct from the "contemplative world."

The CoRT program[6] has six sections, each consisting of 10 lessons: CoRT I (breadth), CoRT II (organization), CoRT III (interaction), CoRT IV (creativity), CoRT V (information and feeling), and CoRT VI (action). All teachers who use the program should teach CoRT I. (Some teachers use *only* the 10 lessons of CoRT I.) Thereafter, the sections can be used in any order. For example, a teacher might use CoRT I, CoRT IV, and CoRT V. The last section (CoRT VI) is somewhat different from the other sections, in that it provides a framework for a staged approach to thinking.

I believe that thinking is best taught to 9-, 10- and 11-year olds. Youngsters in the middle grades really enjoy thinking, and motivation is very high. They have sufficient verbal fluency and experience to operate the thinking tools. The curriculum is more easily modified in the middle grades to include thinking as a basic subject. But the CoRT materials have also been used with children younger than 9 and with students ranging in age from 12 to adult.

So basic is thinking as a skill that the same CoRT lessons have been used by children in the jungles of South America and by top executives of the Ford Motor Company, United Kingdom. The lessons have been taught to students ranging in I.Q. from below 80 to 140. The lessons have also been used with groups of mixed ability.

David Lane, at the Hungerford Guidance Centre in London, found that the teaching of thinking to deliquent and violent youngsters brought about an improvement in behavior, as measured by a sharp fall in the number of disciplinary encounters these youngsters had with supervisors.[7] William Copley and Edna Copley, in preliminary work at an institution for young offenders, found similar changes.[8] They recounted how one youth, on the verge of attacking an officer with a hammer, brought to mind a thinking lesson concerned with consequences — and quietly put the hammer down. I mention these changes in behavior for two reasons. First, I believe that the true test of teaching thinking is the effect of such teaching on behavior. Second, we do not really have any adequate way of measuring thinking performance. Standardized tests are largely irrelevant, because they do not allow us to observe the thinker's composite performance.

John Edwards taught the CoRt program in lieu of a portion of the science syllabus to a class in Australia. Using an analysis-of-discourse approach to measurement, he found that the trained student did significantly better at thinking than untrained peers; the trained students even seemed to do better in science, although they had had less instructional time devoted to that subject.[9] It is not difficult to show that pupils who have had training in thinking produce a wider scan when they are asked to consider some subject. In Ireland, Liam Staunton found that, before CoRT training, individuals produced an average of four sentences on a topic, whereas after CoRT training they produced an average of 47.[10] We are currently analyzing data from the experiment in Venzuela and data from the Schools Council project in England.

I prefer that CoRT users carry out their own tests and pilot projects. Tests carried out by the designers of a program are of limited value for two reasons: 1) the conditions of teaching are ideal (and

often far removed from those prevailing in schools where the program will be used), and 2) such studies always contain an element of bias.

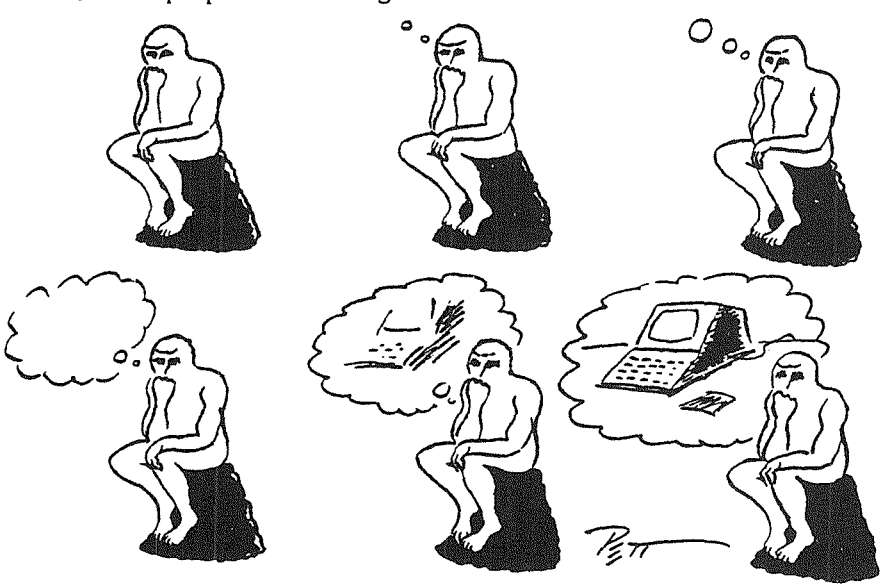
It is impossible, however, to measure the soft data: the confidence of those who have had training in thinking, the focus of their thinking, their willingness to think about things, the effectiveness of their thinking, their structured approach and breadth of consideration. Teachers often sum up these factors as "maturity", in commenting about those children who come to their classrooms after some training in thinking.

I would expect four levels of achievement in the acquisition of thinking skills through use of the CoRT program:

- *Level 1.* A general awareness of thinking as a skill. A willingness to "think" about something. A willingness to explore around a subject. A willingness to listen to others. No recollection of any specific thinking tool.
- *Level 2.* A more structured approach to thinking, including better balance, looking at the consequences of an action or choice (taking other people's views into account), and a search for alternatives. Perhaps a mention of a few of the CoRT tools.
- *Level 3.* Focused and deliberate use of some of the CoRT tools. The organization of thinking as a series of steps. A sense of purpose in thinking.
- *Level 4.* Fluent and appropriate use of many CoRT tools. Definite consciousness of the metacognitive level of thinking. Observation of and comment on the thinker's own thinking. The designing of thinking tasks and strategies, followed by the carrying out of these tasks.

In most situations, I would expect average attainment to fall somewhere between levels 1 and 2. With a more definite emphasis on "thinking," this would rise to a point between levels 2 and 3. Only in exceptional groups with thorough training would I expect to find average attainment at level 4.

Perhaps the most important aspect of the direct teaching of thinking as a skill is the self-image of a youngster as a "thinker," however. This is an operational image. Thinking becomes a skill at which the youngster can improve. Such a self-image is different from the more usual "value" images: "I am intelligent" (I get on well at school) or "I am not intelligent" (I do not get on well at school, and school is a bore). Value images are self-reinforcing. So are operational images — but the reinforcement goes in opposite directions at the negative end. In other words, the less intelligent students find repeated evidence of their lack of intelligence, but they also notice those occasions when they do manage to come up with good ideas.



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Current Approaches to Research in Sociology of Education

Charles Farrugia

Students who attempt to tackle isues in Sociology of Education are often confused by the divergent, sometimes conflicting, research approaches adopted by exponents of this emerging discipline. This paper explains that the debate among sociologists about which form of systematic study constitutes the legitimate scientific method of tackling sociological problems has diminished in intensity. In line with Dave (1972) and Nisbet (1980) it suggests that traditional positions on whether the positivistic, or the interpretative, or the phenomenological approach, among others, is the only approach, have become less catergorical. It expands on Lacey's view that

> the tension that exists in modern sociology between the theoretical models is one of emphasis rather than exclusion and replacement (1977, p. 17)

The paper further suggests that it is acceptable to apply an investigative strategy which incorporates aspects of different approaches if these are the most suitable to a particular enquiry.

Sociology and the Human Consciousness

Most modern sociologists accept the empirical emphasis of the positivistic approach which regards the collection of accurate data as an essential element in the social researchers' work (Kalakowski, 1972), and at the same time reject the more restricted Comtean notion of positivism. The latter stresses that sociological research should emulate the traditional natural sciences where researchers regard themselves as detached observers totally unaffected by the subject under study as well as from its possible outcome. Apart from the fact that contemporary 'natural' scientists are more concerned with notions of probability than absolute universal laws, many scientists stress the human emphasis even when they deal with inert substances. Bronowski, for example, relates science with its human origin, and emphasises that

> knowledge in general and in science in particular does not consist of abstract but of man-made ideas, all the way from its beginnings to its modern and idiosyncratic models... discoveries are made by men, not merely by ideas, so that they are alive and charged with individuality (1981, p. 10)

Furthermore, most sociologists agree that their type of research differs significantly from natural sciences research in that it deals with people and their interactions with each other as well as with their environment, not with inert substances. While retaining the ideology of science as a free and unfettered pursuit of knowledge, contemporary sociologists are acutely aware that researchers and their subjects are people who inevitably interact, and are influenced by each others' perceptions (Denzin, 1970; Blalock, 1977). As a result most current sociological studies are influenced by the interpretative approach which Worsley stresses that:

> the 'external' world can only be known to us through the operation of our minds,and that our minds are not blank, but furnished with mental structures which affect our perception and understanding of the world (Worsley, 1977, p. 10)

The interpretative approach recognises that empirical data, regardless of their scientific origin, are collected, selected and interpreted by the sociologist as a human being. Thus, the sociologist is able to bring to bear the 'human consciousness', that is, the ability to act and react, to think and speculate, to recall and to project. These human attributes go well beyond the mere collection of empirical data. In Sociology of Education, this principle was well established as far back as 1932 by Waller in his seminal work *The Sociology of Teaching*, and later by Musgrave (1965).

The Relationships Between Sociology as Science and Society at Large

Sociologies cannot ignore the Marxists' emphasis on the definite interrelationship that exists between sociology as a science and society at large. Both the sociologist conducting the research and the actors being researched form part of a larger complex. All are influenced by the particular situations, concerns, and occurrences taking place at a particular point in time. The behaviour of an individual whether it is conventional and accepted, or whether it is deviant and abnormal, tends to have an impact not only on the individual concerned but also on the other members of the community. Expected behaviour reinforces the conventional norms of the group; deviant behaviour creates a social problem which is noted or ignored depending on its impact. The point is, then, that the social enquiry of individuals leads to the study of those individuals in relation to their peers. The search for an understanding of the daily lives of individuals must necessarily be gauged against the norms operating in their social organization.

In view of the above contemporary sociologists relate their research to the wider social processes and cultural values operating in a particular society. They usually take great care to attune their work to the Weberian view that sociologists and society are interwined, that sociologists have to take into account the existence of others since they are affected by the existence and actions of others.

Such an approach is particularly relevant to enquiries in the field of education. Indeed, most modern educational sociologists take good note of Gintis' (1972) complaint about their prerdecessors who have often ignored the fact that educational research takes place in a social context. Serious educational sociologists no longer treat education as if it exists in a social vacuum, as the works by Cortis (1979, 1985), Jackson (1968), Lortie (1973), Morris & McIntyre (1969), Musgrove and Taylor (1969), among others, amply demonstrate.

Deduction and Induction in Sociological Research

Most current researchers in sociology accept the principle that casual observations of social phenomena need to be formalized in conceptual terms to facilitate proper investigation through a systematic enquiry (cf Lazarsfeld and Rosenberg, 1955; Lazarsfeld, 1958; Willer 1967). Similarly, contemporary educational sociologists accept an emphasis on empiricism in so far as it translates non-systematic observations of the educational phenomena into hypotheses which can be tested through systematic analyses. At the same time, however, their work is generally approached with an awareness that the sociological — indeed the 'natural sciences' — process of the hypothetico-deductive research method is not as structurally perfect as some literature on the subject claims. It is generally acknowledged that the human interactionist element in sociological research renders neat, unschackled, unobstructed research processes utopian, if not bogus. Such an approach accepts Shipman's (1972) assertion that for social scientists to pretend otherwise is to perpetuate the dichotomy between the 'double faced' approach of structured processes as presented to the public and the actual reversals which take place in actual research. Bechhofer stresses the point further:

> The research process then, is not a clearcut sequence of procedures following a great pattern but a messy interaction between the conceptual and the empirical world, deduction and induction occurring at the same time (1974, p. 73).

Moreover, in developing a theoretical framework for sociological studies in education, contemporary researchers often take great care to guard against the danger inherent in a rigid application of the hypothetico-deductive method which starts from hypotheses that reflect the researcher's own assumptions, and proceeds within a structure that reinforces those hypotheses and his or her particular point of view. Instead, the pragmatic researcher is well aware of Kuhn's (1962) emphasis on the relative nature of observations, and his theory that discoveries are often made when the expected results fail to materialize. Such a frame of mind is more likely to enable the researcher to widen his or her vision, to incorporate the views and assumptions of others, and to regard the situation as others see it.

Such precautions become particularly pertinent in those studies where the researcher is directly involved, sometimes intimately, in the educational system, or institution or the project being investigated. Rigid adherence to one's point of view and arbitrary selection of data to reinforce the selected hypotheses can become easy temptations in a situation where educational and administrative decisions by others may have had

great impact on one's professional orientations, career and life-style. Similarly where one's own deeds and decisions may have had some influence or are likely to influence on the professional development of others.

On the positive side, such an involved position can provide the inside knowledge demanded by the interactionist and grounded-theory approach as proposed by Glaser and Strauss (1964), or the phenomenological blend favoured by many contemporary sociologists (Blalock, 1964; Alker, 1965; Borgatta, 1971). Indeed, Nisbet argues that research directly related to one's regular work, allows the researcher to get "inside the skin of the situation" (1980, p. 6), and suggests that this type of research in education is more likely to lead to action and innovations. Good examples of this approach can be seen in the works by Flaners (1970), Galton (1980), Hilsum and Cane (1971) and Lacey (1977).

Finally, most contemporary educational sociologists are cautious about making predictions, for even if one accepts the sociological position that an enquiry of contemporary situations becomes unavoidably interlaced with events from the past and orientations towards the future, no researcher can be absolutely certain that his or her predictions will prove correct. Thus contemporary sociologists generally avoid the temptation to be prescriptive. If one were to accept the Mannheimian notion of "utopias" which regards people's behaviour as conditioned by their expectations and aspirations, one cannot ensure that people will react as expected and in identical responses even when the stimuli or the situations are identical. The majority of educational sociologists therefore, avoid offering absolute solutions. Instead, they prefer to identify problems and establish hypotheses. They attempt to explore the research parameters. test them for consistency and offer proposals on how some of the solutions can be approached. In the process most educational sociologists follow Taylor's advice (1973) and aim to make people aware, sensitize them about an educational problem in the hope that they will be willing to do something about it.

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Conducting Process-Product Studies: Some Considerations

Mark G. Borg.

Introduction

One of the major factors which determines the validity of research findings is undoubtedly the effectiveness of the decision-making process in setting up a design and a general methodology which are both rigorous and compatible with the aims of the study. Indeed, all the decisions made, be they major or minor ones, and related problems, vary from one study to the next depending largely on the nature and purpose of the exercise. The great majority of decisions required in designing a study are made in its early stages. It is usually the case, however, that in the course of a study other decisions would have to be taken. Since most decisions are interrelated, a change in one would precipitate a change in, or a reconsideration of, at least a second decision.

Vis-a-vis the above, it is the purpose of this paper to discuss some of the aspects and issues which should be considered in a research study of the relationship between teaching and attainment. Although most of the following arguments and considerations would be valid for such a study at the primary or secondary level of education, these would be more true at the former level.

The variables

In very broad terms, a study of this type would essentially entail an investigation into the effects, the products, of teaching. It would be concerned with the extent to which pupil performance in previously acquired cognitive abilities and skills improve as a result of their classroom experiences; whether or not the type of teaching enabled them to acquire new skills. In the literature, such investigations are referred to as "process-product" studies (e.g. Eggleston et al., 1976).

One of the first major decisions that the investigator has to make relates to the definition of the variables. What will "teaching", the main independent variable, mean in the context of the study? One can define and differentiate between teaching methods either on criteria as established by other studies in the field (e.g. Hilsum & Cane, 1971; Bennet, 1976; Galton et al., 1980), or by establishing, empirically or otherwise, the study's own criteria. The choice of the first option would seem to depend on whether or not these criteria would still be relevant in terms of age-range and the level of education as decided upon in the proposed study.

Will "attainment", the dependent variable, be taken to mean accomplishment in school subjects as measured by standardised or non-standardised attainment tests, teacher-based assessment, or a combination of any of these? The school subjects on which attainment measures will be taken have to be determined at the outset bearing in mind the commitments that participants (especially teachers) will have to make; and where applicable the availability of a research team, funds and resources.

There are several extraneous variables which might affect attainment. The age, social class, and the initial cognitive abilities of the pupils; the teacher's teaching experience, and the class and school environments are merely some of these variables. If the study is concerned with the casual aspects of the relationship between teaching and attainment, then it is imperative that systematic control is exercised on all such variables. Failing to do so would mean that any possible conclusions would be correlational in nature; like, for instance, the incidence of improvement in pupil performance and teaching style.

The Research Design

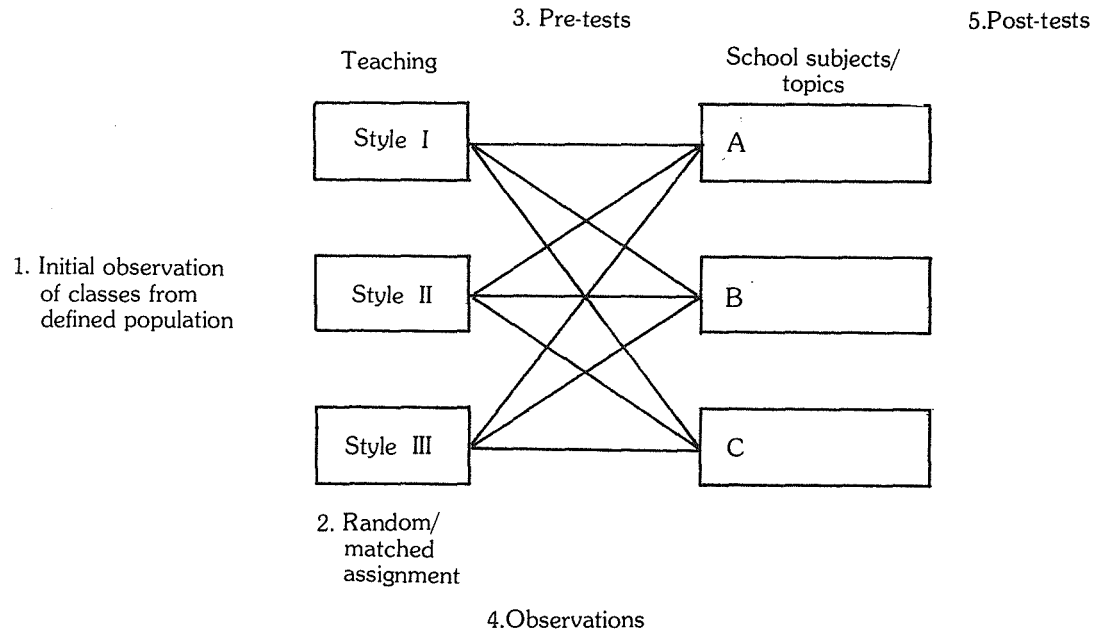
The study would lend itself to two main types of research designs: the experimental design and the longitudinal/survey design.

The experimental design

This design (see Fig. 1) enables the researcher to investigate cause-and-effect relationships between several styles of teaching and pupil attainment in any number of school subjects (using a factorial design; Lewis, 1968). It would necessarily involve the initial observation of classes from a defined population; from which a sample is drawn randomly or by matching subjects. Pupils are then assigned in a systematic way to the different teaching styles. They are tested before and after the experimental teaching period and mean gain test scores are compared to determine which teaching style caused the greatest improvement in performance.

Apart from problems of a methodological nature (e.g. the extensive control of extraneous variables), the main objection to this design is an

Figure 1: An Experimental Design



ethical one arising from exposing groups of children to experimental conditions which may make them underachieve. Also, the design presupposes that, all other things being equal, the effect of teaching styles is constant for all pupils irrespective of such factors as motivation and temperament.

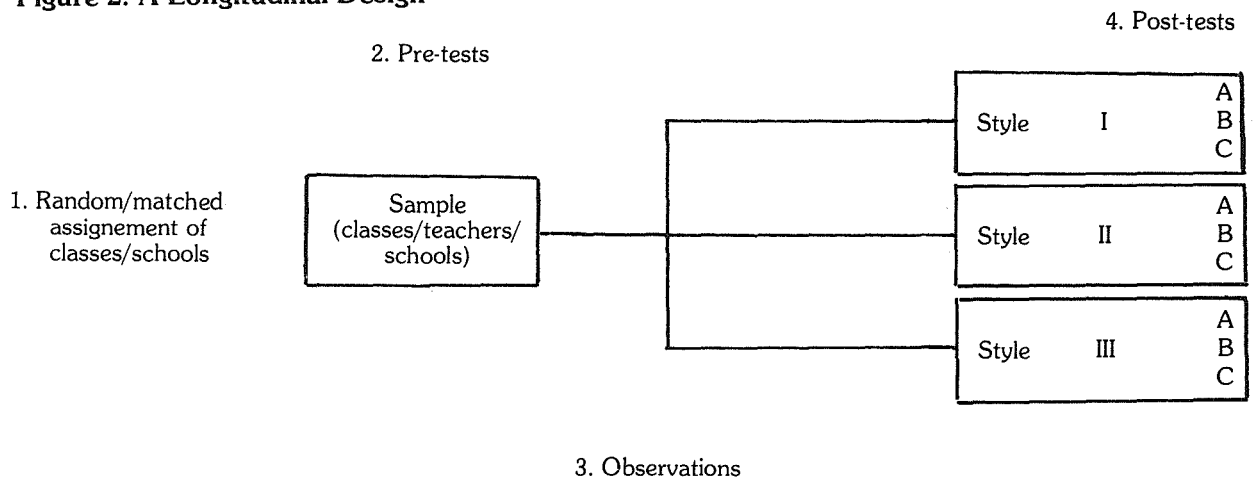
Most of these problems can be overcome by using a quasi-experimental research design (cf. Bennett, 1976). However, since in this situation the pupils and conditions are taken as they occur in the sample, a cause-and-effect relationship cannot be established (Vasta, 1979).

The longitudinal design

As is evident from studies which are based on this approach (e.g. the ORACLE studies: Galton et al, 1980; Galton & Simon, 1980), it involves the systematic collection of information in its ordinary settings. Depending on the rigorourness of sampling procedures, the information can be used to establish a causal or non-causal relationship. In the ORACLE studies, for instance, the sample was matched for several variables and the definition of teaching styles depended entirely on analysis of the interaction between teachers and pupils.

Each of these designs has its own particular problems. Both of them, however, require that the

Figure 2: A Longitudinal Design



pupils be exposed to the styles of teaching (in ordinary or experimental settings) for a substantial length of time (Carroll, 1963).

The Researcher's decision on which design is most appropriate for the study will determine several aspects of the general methodology, the most outstanding of which are: the sampling procedures; the methods of data collection; and the statistical analysis of the data. These will be discussed in turn.

The Sample

Sampling unit

This may be any of the following: pupil teacher, class, school, or catchment area. In view of the nature of the study it seems that the ideal sampling unit would be the class/teacher or the school. An important decision in this regard is which classes/schools would make up the population to which the study is addressed. Special classes/schools or children falling outside an established age range can be excluded; in which case the sampling unit is restricted to normal classes/schools or children of a certain age. Such restrictions could, of course, affect the representatives of the selected sample.

Sample size

This is a relatively minor decision. What is really crucial is not so much the actual size in terms of large numbers as much as having a large enough sample as to be representative of the population. It is indeed imperative that the sample should have representative characteristics in terms, for instance, of the social and home background of the pupils (e.g. Stallings, 1976), or on how teachers compare (in terms of age, sex, teaching experience, experience with the present age-group, etc.) with the national population.

In educational research, it is often the case that the size of the sample is dictated by the availability of subjects (Evans, 1968). Some schools or teachers, for instance, may refuse to participate. Then there is always the possibility of pupils and teachers absenting themselves from school (the absence rate, incidentally, can indicate attitudes towards teaching and schooling), or teachers who agree to participate but leave the sample at some stage of the study (especially so in schools where the teaching staff is unstable). One can, of course, decide on selecting a large sample for the purpose of containing such non-random sample attrition. But because sample loss is "non-random" it becomes increasingly difficult to ensure that the representative of the sample in terms of some is not adversely affected. When deciding upon the size of the sample, moreover, the researcher must bear in mind what types of comparisons of variables are envisaged so as to avoid the situation where not enough subjects (or data) are available; or if they were available, they are not representative of the same in terms of some variable (e.g. attainment), as was the case in the Lancaster studies (Bennet, 1976; pages 105-106).

Sampling procedures

Of all the aspects of the general methodology, sampling procedure is perhaps the most crucial mainly because it determines whether or not the sample is representative ofthe population; whether or not the eventual findings could be generalised.

If the sample can be considerably large, then the ideal sampling model would be stratified or dimentional sampling (Cohen & Manion, 1980). But as is often the case in educational research carried out in the school, the ideal is rarely possible. Therefore, it seems, that the matching model is the most practicable of the two. Pupils can be matched on several variables like sex, age, initial cognitive abilities, intellectual ability, and social class. Teachers, on sex, qualifications, teaching experience, their attitude towards the subject/s taught, and their teaching objectives. Schools can be matched on certain features like catchment area (urban - rural), and its socio-economic level, organizational and curricular patterns (as in the ORACLE studies), and goals, Since the school building can influence the method of teaching then the researcher should probably have to include this as one of the criteria for selecting schools. A further decision is whether or not to include all the classes in these schools or to randomly select a number of classes from each school. Irrespective of the level of education (primary, secondary, or both), the selection of classes would determine which teachers would be expected to participate. If the study is carried at the secondary level, however, then one has to take account of the possibility of "spill-over" from one teacher/subject to the next. A "good" science teacher, for instance, can influence pupil performance in say mathematics. Ideally, of course, related subjects should be included as part of the variables so as to avoid biased data. Moreover, apart from the problem of teacher reluctance to take part in the study, the teachers (within a catchment area/school) could be non-randomly distributed like, for instance, having highly efficient teachers employed in particular schools. The random selection of teachers by class should, however, average this out provided of course that these schools (or some of them) form part of the sample. The researcher must also be wary of the common characteristics of teachers who agree or decline to participate. Volunteer teachers, for instance, are likely to be "self-confident", relatively open teachers, almost all of whom may be superior to a non-volunteer sample on an unknown number of unidentified dimensions" (Berliner, 1976; page 10)

Data Collection

The study would essentially involve the collection of data on the styles/methods of classroom teaching and on the scholastic performance of the pupils.

Teaching styles

This data can be collected through two major procedures: (a) systematic classroom observation, and (b) the structured interview and/or self-administered questionnaire.

(a) Systematic observation

An important decision in this regard is whether the observation should focus on describing the actual types of teaching or to include also a description of what happens in the classroom (i.e. describing processes). Several writers have criticised the use of observation instruments which disregard contextual data like the subject taught, the use of teaching aids and available facilities, seating arrangements, and set-work (Hamilton & Delamont, 1974), and argued in favour of an adequate description of this context (Rosenshine, 1970; Rosenshine & Furst, 1973; Dunkin & Biddle, 1974). The categories making up the schedule, as Bennett & McNamara (1979) point out, "are usually derived in three ways, either from theory or previous research, by modification of existing schedules, or from prior observations in the classroom" (page 35). Although it is sometimes possible that such an instrument which suffices the purpose of the study already exists - a schedule whose reliability and validity are established - most researchers, as McIntrye (1980) maintains, attempt to develop their own schedules. This, of course, together with the piloting of the instrument in the classroom setting, would involve a great deal of time and effort in terms of deriving meaningful categories either by liasoning with the teachers or by visiting different types of schools recording as comprehensively as possible all the teachers' and pupils' activities. The investigator is then faced with the problem of deciding which features of teacher and pupil behaviours are relevant to the objectives of the study (Hilsum & Cane, 1971). Once these are established, two important sampling decisions have to be taken: what samples of behaviour will be recorded and what samples of time. The time unit adopted, for instance, is likely to affect the description gained (Bennett & McNamara, 1979). Too many categories of behaviour as well as too brief a sample of time, moreover, are bound to lower the reliability level of the schedule. One way of allievating these problems is by adopting a continuous recording of behaviours as in the Hilsum & Cane schedule. Moreover, as Hurwitz (1973) points out, the reliability and validity of the schedule should be determined from pilot test bases before it is put into actual use. The researcher then has to train/make provisions for training observers in the use of the schedule, especially so in the classroom situation. This is indeed a crucial part of the study (Hilsum & Cane, 1971). Before and during the actual observation sessions, high inter-observer reliability ratigs must be obtained so as to ensure that the observer/s is/are recording classroom events on the same criteria. Inevitably, this exercise could add to the "inconvenience" to teachers and pupils of having a person or persons recording classroom behaviours, no matter how unobtrusively so. Although some writers (e.g. Heyns & Lippitt, 1954; Kerlinger, 1964) state that the observer has little or no effect on the situation observed, the researcher must take in consideration the possible disruptive effects that the observer's presence could have on the pupils, and how this would affect the collected data. Indeed, as Medley & Mitzel (1963) and Samph (1976) point out, some observed behaviours do change even if others do not. The ideal situation would be to collect the observation data in a non-reactive fashion (Cheyne, 1979), but as McIntyre (1980) asserts, some reactions are to be expected and that "participants reactions to being observed are likely to depend on what they see as the function of the observation" (page 16). This, of course, gives rise to the problem of how far should participants (teachers and pupils) know about the nature of the observations. Persons et al. (1976), for instance, argue that teacher anxiety arising from the collection of data from his/her class can be minmized if the teacher knows what the observer is going to look for, and has access to the recorded data. On the other hand, if the teacher is so well informed one would be increasing the incidence of the Hawthorne effect and the resultant bias of the data. Besides all this, one must also bear in mind that what the observer has been "judging may not be an individual's true ability to perform but more the ability to respond to the challenge of an observation" (Samph, 1976; page 741).

The effort that the teacher and the pupils put into a lesson depends on several factors; not least the time of day and the day of the week. Moreover, the "performance" of the teacher is often influenced by his knowledge of, and attitudes towards, the subject being taught. This, of course, is especially the case in the primary level. Systematic sampling of classroom activities is therefore essential such that the collection of such biased data is avoided or at least averaged out.

(b) Structured interviews and/or self-administered questionnaires

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Gwida Prattika għall-Kitba tal-Malti.

Edward Fenech

Synopsis:

Maltese orthography presents a hard nut to students and teachers of Maltese alike. The perusal of a normal grammar of Maltese presents the teacher of Maltese who is not specialized in the subject with a number of difficulties. In practice, these can be overcome or at least put aside as irrelevant at a primary level. Such a guide can be found in the booklet *L-Ortografija Moderna* by Edward Fenech O.S.A., Malta, 1983. Here, a group of 82 rules governing the most common Maltese mistakes are discussed and presented in a threefold manner. In Section I, enumerated practical rules governing such mistakes are given: most of the rules are built on pattern-form, others follow some form of association of ideas, while others are simply presented in their correct form quite often in conjunction with other homophones; in Section II, exercises are given on one or more closely related rules in the same order of presentation as in Section I; in Section III, finally, an alphabetic list of 250 words or particles mentioned in the discusssion of the rules in Section I is given for easy reference; every word or particle presented here is followed by the number of the rule under which it is discussed in Section I for easy reference. The booklet contains also an analytical index of all the practical rules in Section I, and a general index.

Introduzzjoni

Hu fatt li hemm ħafna għalliema jgħallmu l-Malti mingħajr ma huma speċjalizzati fih. Dan jiġri kemm fl-iskejjel primarji, u kemm fl-iskejjel sekondarji. Waħda mill-kawżi ta' din is-sitwazzjoni hi s-sistema tal-'framentation' adottata fl-iskejjel sekondarji. Fil-każ ta' l-iskejjel primarji hi 'policy' komuni fl-Ewropa li l-istess għalliem igħallem is-suġġetti kollha lit-tfal tal-klassi tiegħu. Għalhekk jidher li taħt forma jew oħra ser jibqa' jeżisti fis-sistema edukattiva tagħna l-għalliem mhux speċjalizzat fil-Malti.

Hi sfortuna mhux żgħira li l-għalliem tal-Malti li mhux speċjalizzat fis-suġġett se tiġi f'idejh kemm-il grammatika tal-Malti li jkun fiha mhux biss difetti żgħar, imma wkoll tagħlim għal kollox ħażin. Hekk, fil-ktieb *A Grammar of the Maltese Language* ta' E.F. Sutcliffe (Malta, 1950), il-verbi li jisiċċaw bl-*għ* huma meqjusa bħala dgħajfin. Hekk ukoll, fit-*Tagħlim Fuq il-Kitba Maltija,* it-Tieni Ktieb, id-Disa' Edizzjoni, Malta, 1968, pp. 8.12, insibu diskussjoni dwar 'l-aċċent maħtuf ħafif, l-aċċent maħtuf sħiħ u l-aċċent imkarkar'. Fil-fatt, dawn l-hekk imsejħa 'aċċenti' mhumiex ħaġ'oħra jekk mhux l-aċċent ewlieni. L- għażla bejn 'maħtuf ħafif' u 'maħtuf sħiħ' hi ortografika u mhux fonetika, u għalhekk hi bla bażi. Dak li hu msejjaħ 'aċċent imkarkar' ma hux ħaġ'oħra jekk mhux aċċent ewlieni li jaqa' f'sillaba li fiha vokali twila ('imkarkra'). Ħwejjeġ żbaljati bħal dawn qegħdin ikunu mgħallma minn min ma hux għalliem speċjalizzat għax isibhom fis-sillabu, u hu ma jkunx jista' jagħżel bejn it-tajjeb u l-ħażin.

1. Fuq il-mudell N I Ż L A
   ikteb GHO L J A
   meta jkollok nom, femminil, singular.

   Nota: Biex tħaffef il-kitba ta' ħafna kliem bil-Malti għandek tinqeda bil-mudelli kemm jista' jkun. Dan ifisir billi tieħu kelma ħafifa, bla **għ** u bla **ħ**, li jkollha l-istess binja tal-kelma t-tqila, tniżżilha fuq biċċa karta ittra ittra bi ftit spazju bejniethom, u taħt kull konsonanti tal-mudell tniżżel il-konsonanti li tkun tmiss fil-kelma t-tqila, u taħt kull vokali tniżżel il-vokali tal-kelma li tkun trid tikteb sewwa. Dan jidher f'ħafna mir-regoli mogħtija hawnhekk.

2. Fuq il-mudelli H A L I, H A L J A
   ikteb GHA L I, GHA L J A
   meta bl-Ingliż tgħid *costly, expensive; sorrow, grief;*
   u GHO L I, GHO L J A
   meta bl-Ingliż tgħid *high, costly, expensive.*

3. Fuq il-mudelli O H L A, L - O H L A
   ikteb O GHL A, L - O GHL A
   meta jkun aġġettiv fil-komparattiv bla artiklu jew bl-artiklu.

4. Fuq il-mudell H E L A
   ikteb GHO L A
   meta jkun verb fil-passat, ġens maskil, għadd singular.

5. Fuq il-mudell J A H L I
   ikteb J O GHL A
   meta jkun verb fil-preżent, ġens maskil, għadd singular.

6. Fuq il-mudell A H L I
   ikteb O GHL A
   meta jkun verb fl-imperattiv, għadd singular.

7. Fuq il-mudelli N I Ż E L, N I Ż L E T
   ikteb T E L A ', T E L GHE T
   meta jkun verb fil-passat, fit-tielet persuna, ġens maskil jew femminil, għadd singular.

L-Ortografija Moderna

L-għalliem tal-Malti li ma jkunx speċjalizzat fis-suġġett jista' jsib ta' għajnuna l-ktejjeb tiegħi *L-Ortografija Moderna,* Malta, 1983, pp. 40. Hu għandu jsibu faċli biex jinqeda bih fit-tagħlim għaliex jagħti biss regoli prattiċi, bla ebda kliem tekniku. Hu qasir u intenzjonalment jagħti 82 regola, għalkemm dawn iħaddnu 250 kelma jew partiċella li tippreżenta diffikultà. Minbarra r-regoli bl-eżempji, fih taqsima għat-taħriġ fuq vokabolarju li jitħaddem regolarment fil-ħajja ta' kuljum. Fih taqsima apposta li turi fl-ordni ta' l-alfabet il-250 kelma jew partiċella l-iktar komuni fost dawk li joħolqu diffikultà fil-kitba tal-Malti. Jekk l-għalliem ikun irid ifittex ir-regoli taħt irjus tekniċi jew semi-tekniċi, għandu werrej analitiku apposta bir-riferenzi kollha meħtieġa. Dan il-werrej ikun utli l-iktar għal min ikun qed jinqed b'xi grammatika Maltija fejn ikun hemm termini grammatikali u jkun irid iqabbel ma' dak li jingħad fir-regoli prattiċi ta' dan il-ktejjeb.

L-Ewwel Taqsima: Regoli Prattiċi

Hafna mir-regoli prattiċi jittrattaw il-problema ta' l-*għ* jew ta' l-*h* u l-pożizzjoni ta' dawn fil-kelma. Biex l-għalliem iħaffef għalih u għall-istudenti l-kitba ta' kliem bħal dan ma hemmx triq oħra eħfef minn dik li joffru l-mudelli ta' kliem simili, imma li ma jkunx fih u la *għ* u la *h*. Il-mudell jaħdem b'mod li fejn ikun hemm konsonanti fil-kelma l-faċli tinkiteb taħtha konsonanti (dejjem dik li jkun imiss skond l-ordni tal-konsonanti ta' l-għerq), u fejn ikun hemm vokali tinkiteb vokali taħtha skond is-sekwenza vokalika tat-tieni kelma Hekk:

fuq il-mudell	N	I	Ż	L	A
ikteb	GĦ	O	L	J	A

meta jkollok nom farrad, femminil, singular.

Il-mudell ġie li ninqdew bih meta jkun hemm l-omofoni jew kliem b'ħoss wieħed u tifsira differenti. Hekk:

fuq il mudell	N	IE	Ż	E	L
ikteb	T	IE	L	A	'

fil-waqt li

fuq il-mudell	N	IE	Ż	L	A
ikteb	T	IE	L	GĦ	A

Dan juri li *tiela'* fil-maskil singular tinkiteb bl-*għ* f'tarf il-kelma, fil-waqt li *tielgħa* fil-femminil singular tinkiteb bl-*għ* qabel l-aħħar vokali tas-sekwenza vokalika ie-a. Fil-ħoss iż-żewġ kelmiet huma l-istess, imma fit-tifsira u fl-ortografija huma differenti.

Imbagħad hemm eżempji ta' kif tikteb bil-Malti li jkunu preżentati fil-forma t-tajba tagħhom bla ebda mudell. Hekk, għandek tikteb *ħdax-il dar* u *kemm-il darba* bla ma ssir riferenza li s-sillaba *il* oriġinarjament kienet *ar* tal-kelma *għaxar (ħdax* = aħad għaxar) fl-ewwel każ u li fit-tieni każ (kemm-il) is-sillaba *il* daħlet bħala analoġija. Dan kien jitlob sforz kbir mill-istudent u l-għalliem, u għalhekk kienet semplifikata.

Bħalma ġara, per eżempju, fir-regoli 20 u 21, ġie li sar użu mill-assoċjazzjoni ta' l-ideat biex toħroġ iktar ċara fil-prattika d-differenza ortografika. Hekk il-kliem MIN u WHO bl-Ingliż huma tlieta bi tlieta, fil-waqt li MINN u FROM bl-Ingliż huma erbgħa b'erbgħa. L-idea ta' 'draw' bejn Malti-Ingliż tgħin biex l-istudent jibqa' jiftakar l-ortografija tal-Malti.

It-Tieni Taqsima: Taħriġ fil-Kitba Maltija

F'din it-taqsima kien evitat li jingħata Malti miktub ħażin biex ikun imsewwi mill-istudenti. Taħriġ bħal dan jagħmel iktar dannu milli ġid billi l-istudenti iktar jibqgħu jiftakru l-kelma l-ħażina li tkun mibnija fuq il-widna milli l-kelma t-tajba li tkun mibnija skond il-ħtieġa ortografika u morfoloġika. Minflok, kien imħaddem l-Ingliż fi 15-il taħriġ minn 40 wieħed. B'hekk, l-istudent jara l-kelma bl-Ingliż u jaqlibha bil-Malti bla ma jkollu ndħil ortografiku.

IT-TIENI TAQSIMA

Taħriġ fil-Kitba Maltija

1. **Taħriġ dwar Regoli 1-6.**

Aqleb għall-Malti:

a) The pilot flew higher than the highest hill.
b) He jumps higher than you.
ċ) Malta's highest hill cannot be called a mountain.
d) This tree will grow up higher than the one next to it.
e) That encyclopaedia is too expensive.

2. **Taħriġ dwar Regoli 7-10.**

Ikteb il-partiċipju preżent flok il-verb passat (Eż: daħal = dieħel).

a) Habibi tela' fuq il-bejt u oħtu niżlet.
b) Min tela' u min niżel.
ċ) Qoffa telgħet u oħra niżlet.
d) Ġanni tela' fuq iż-żiemel.

3. **Taħriġ dwar Regola 11.**

Qiegħed il-kliem flok in-numri:

a) Għadni kemm xtrajt 11 ktieb.
b) Hija ra 17 raġel għaddej jiġri lejn il-knisja.
ċ) L-iskola kienu daħlu 18 tifel biss.
d) 5 minnhom kont nafhom sewwa, 4 ftit li xejn, u d-9 l-oħra qatt ma kont rajthom.

4. **Taħriġ dwar Regola 12.**

Aqleb għall-Malti:

a) Every time you meet me say hello.
b) How many times did you read this book?
ċ) I read this book several times.
d) How many boys have you seen hurrying to school?

5. **Taħriġ dwar Regola 13.**

Imla l-vojt b'waħda mill-prepożizzjonijiet: lil, għal, bħal, minn.

a) Dan il-ktieb ..... ħija.
b) Aġħti din l-ittra ..... Ġanni.
ċ) Din il-larinġa ..... missierek.
d) Dan niktbu ..... min iħobb il-Malti.

Kull taħriġ kien limitat għal regola waħda jew għal regoli marbutin ma' xulxin b'tema. Qabel kull taħriġ hemm nota li tgħid dwar liema regola jew regoli jkun qed isir it-taħriġ. B'hekk l-istudent ikun jista' jirrevedi dik jew dawk ir-regoli qabel ma jaħdmu u jkun iktar ċert mir-riżultat tajjeb.

Din it-taqsima tgħin lill-għalliem tal-Malti mhux speċjalizzat fis-suġġett billi tagħtih l-opportunità li jagħti taħriġ limitat għal ftit regoli kull darba li jagħti l-Homework. Bir-ripetizzjoni ta' l-istess kliem, ikunu mirbuħa aħjar id-diffikultajiet ortografiċi.

Konklużjoni

Il-grammatika tradizzjonali tal-Malti tippreżenta ħafna diffikultajiet lill-għalliem tal-Malti li ma jkunx speċjaliżżat fis-suġġett. L-aħjar soluzzjoni għalih hi t-triq tar-regoli prattiċi. Hekk, jekk wieħed irid igħallem il-konsonanti likwidi, m'għandux isibha bi kbira li jinqeda bl-isem tal-likwidu "Lemonora" ħalli jgħin il-memorja ta' l-istudenti dwar il-konsonanti individwali *l, m, n, r.* L-aqwa hu li l-istudenti jitgħallmu bla ħela ta' enerġija żejda.

SENSIELA ALFABETIKA

Nota: In-numri li jidhru wara l-kliem f'din is-sensiela alfabetika ta' kliem tqil huma riferenzi għar-regoli mogħtija fl-Ewwel Taqsima: "Regoli Prattiċi".

A

Aħjar, komp. ta' tajjeb. 74
Aqħar, komp. ta' ħażin. 74
Alġerin, aġ. m.; n. m. 35
Amerikan, aġ. m.; n. m. 35
April, n. m. 35
Arġentin, aġ. m.; n. m. 35
Awissu, n. m. 35
Awstraljan, aġ. m.; n. m. 35

B

Bagħad, jobgħod, v. 46
Bagħat, jibgħat, v. 46, 69
Baqa', jibqa', v. 30
Bħal, prep. 13
Bħal-, prep. art 15
Bħall-, prep. art. 14
Bi, prep. 66
Biż-żejjed, fr. prep. 34
Biżżejjed, av. 34

Ċ

Ċiniż, aġ. m.; n. m. 35
Ċ!prijott, aġ. m.; n. m. 35

D

Dahar, n. m. 75
Dar, idur, v. 75
Dar, n. f.; pl. djar. 35, 75
Ddemoralizzat. part. 61
Ddisturba, jiddisturba, v. 61
Deha, jedha, v. 49
Deher, jidher, v. 78
Diċembru, n. m. 35
Disa', aġ. num. 41
Disat, aġ. num. 41
Disgħa, n.; pl. disgħat. 40
Dmugħ, n. m. 23
Dqiq, n. m. 32
Dsatax, aġ.; n. 11

E

Eġizzjan, aġ. m.; n. m. 35
Egħluq, n. m. 36
Erba', aġ. num. 41
Erbat, aġ. num. 42
Erbatax, aġ.; n. 11
Erbgħa, n. 40
Erbgħa, L-, n. 35

F

Far, n. m.; pl. firien. 74
Far, ifur, v. 74
Fehem, jifhem, v. 78
Fi, prep. 66
Fih, prep. bil-pron. meh. 32
Filgħaxija, av. 38
Filgħodu, av. 38
Franċiż, aġ. m.; n. m. 35
Frar, n. m. 35

G

Grieg, aġ. m.; n. m. 35

Theory and practice in initial teacher education: the British context

Robin J. Alexander

'Relating theory to practice' is widely perceived as one of the most fundamental and intractable challenges of initial teacher education.

Introduction.

The argument I lead towards in this paper, however, is that while there is indeed a theory-practice problem, conventional diagnoses and associated solutions, far from solving the problem may well have exacerbated it. I shall argue that we need a more comprehensive diagnosis, basic to which must be an understanding of the assumptions which course structures in teacher education institutions have embodied and an honesty on the part of all of us - teacher educators, teachers and administrators - about the extent to which our own assumptions, attitudes and practices might hinder rather than help our student-teachers to make that vital theory-practice synthesis. I write about the context I know best, that in Britain. I make no comparisons with or extrapolations to the Maltese context: that is for others to do.

Theory and practice

Let us first be clear about the problem we are discussing. As usually perceived in Britain it has several aspects:

1. Students complain that some or much theoretical study, particularly in education theory, is 'irrelevant' to their immediate needs to cope and survive under pressure on teaching practice or in their first post.
2. Serving teachers retrospectively argue that much of the theory they received did not equip them for the actual challenges they faced in school.
3. Students have great difficulty in doing what they are expected to do, namely to 'apply' the theory they receive to practical teaching challenges; or to be more specific, while they may be able to apply theory to the intellectual *analysis* of teaching, they can less readily apply it to the *solution* of practical problems.
4. Recent research on experienced teachers at work in classrooms shows them operating successfully on the basis of conceptual framework, a 'craft knowledge', a way of thinking about practice, quite unlike that propounded in the training institutions.[1] This 'practitioner's theory' (for it is indeed a theory and needs to be recognised as such) is idiosyncratic, commonsense, intuitive, eclectic, pragmatic, situation-specific, and very difficult to pin down and generalise about; whereas the essence of traditional education theory is that it is highly explicit, generalised, rational, systematic (discipline-based) and academic. So that *what we have is not merely a theory/practice problem but a theory/theory one: academic theory on the one hand, practitioner theory on the other.*

These are the problems to which teacher educators have vigorously addressed themselves during the past two decades.

In recent course developments, the earlier eclectic mixture of psychology, 'great educators' and classroom prescription, which was seen to fulfil the need for a *professional* theory, has been superceded by the more demanding educational studies of the 1960s and 1970s, in response to *academic* requirements. The emerging disciplines of education rapidly acquired an independent momentum as academic studies in their own right. Segregated from the so-called 'professional' components in initial teacher education they indeed met existing criteria of 'degreeworthiness' central to university validation; but at the same time the theory-practice gulf became more pronounced. Some of the devices which were introduced to ameliorate this 'theory-practice' problem, as it was perceived included: the integration of the education disciplines round professional themes; the blurring of boundaries between educational and professional studies; the application of theoretical constructs in school-based activity. Yet the theory practice problem persisted. Why should this be so?

Two sorts of causes suggest themselves. One is that the various solutions have been inappropriate. The other is that the 'problem' itself has been incorrectly defined in the first place: a perfectly feasible diagnosis, since the 'theory-practice problem' is itself only another theoretical construct.

The dominant view of theory during this period has been of its constituting a set of propositions about children, teachers, educational processes and contexts. Such propositions are validated by (i) the methodology of the social sciences, particularly the positivistic tradition within that methodological spectrum; (ii) their origin, predominantly, in the institutions which define themselves, and are publicly defined, as existing to create and disseminate such propositional knowledge. This view, tacitly more often than overtly, has informed much debate about the 'theory-practice problem' in teacher education. The theory was 'given', so the 'problem' was to find ways of making its 'relevance' to students' and teachers' practice understood by them. The implicit analogy, as Jonathan pointed out,[2] was with those professional activities whose theory is firmly grounded in the physical sciences - medicine and engineering for example - where previous empirical study would be expected to provide the formulae for the solution of subsequent practical challenges. But the view of teaching as an applied science is scarcely tenable, partly because of the infinite complexity, variability and physical science) of the social sciences, partly because ofthe infinite complexity, variability and unpredictability of human minds and interactions (by comparison with, say, concrete or metal structures), and partly because of the value-dimension which pervades all educational action.

Yet despite this, generations of students were encouraged to use as the ultimate criterion of validity for educational propositions not their own or serving teachers' observations and experience - often dismissed as 'mere' 'intuition', 'commonsense' or 'subjectivity' - but the apparently incontro-vertible 'research has proved that...' This oracular authority they were encouraged to extend to anyone whose views on educational matters had appeared in print - a field which ranged from writers offering profound insight as the result of sustained intellectual effort to the entrepreneurial authors and editors of moneyspinning textbooks and readers. Educational studies and professional theory, then, were treated as synonymous. The 'problem' was not *whether* the former were appropriate to the needs of the intending teacher, *but how to demonstrate* that they were.

By the early 1970s, however, the givenness of 'theory' so defined was being questioned:

> 'The job of theory is to evoke judgment rather than rote obedience. The application of theory to practice is the bringing to bear of critical intelligence upon practical tasks rather than the implementation of good advice.'[3]

Others pointed out that serving teachers could not, or did not, to any fundamental extent 'apply' such theory to the solution of everyday professional tasks. Coming from serving teachers (as much objections had for years) that view was seen if anything as an argument for increasing the theoretical content of courses. But coming from a university researcher (McNamara) going back into the classroom the argument could not be that readily dismissed. As he somewhat irreverently pointed out:

> 'Developments in glue technology have had a greater impact upon the primary scene than developments in classroom research'[4]

And as Dunlop argued, after an analysis of 1970s articles on the theory practice issue:

> 'These papers show a growing consensus that the 'disciplines' approach to education theory... is unsatisfactory, and a realisation that the criterion of 'relevance' is not just the 'problem-centred' nature of theory but the question of whether it actually does help the teacher to understand his stituation.'[5]

By the late 1970s, therefore, solutions more fundamental than 'integration' were being explored The first was an attempt to generate a new professional theory grounded in the close analysis of classroom practice, which by then had become a significant strand in educational research. But

Hirst and McIntyre were among those who argued that this aspiration was doomed to failure: 'There is not, and cannot be, any systematic corpus of theoretical knowledge from which prescriptive principles for teaching can be generated'. Hirst's alternative was eclecticism - 'raiding the disciplines' as he termed it - in pursuit of whatever insights were available.[6]

A rather different line of enquiry stemmed from the acknowledgement - somewhat belated one might suggest - that since some of the most successful professional practice is not apparently informed to any significant extent by academic education theory (though it is a moot point whether such theory has been assimilated and is informing practice in ways that teachers may be unable to explain), the task was to explore the ideas which teachers actually draw on rather than seek ways of making them 'apply' ideas they self-evidently can do without. McNamara and Desforges attempted to codify the 'craft knowledge' of serving teachers in order to use it as a basis for initial training. Such codification was not successful: *the explication of the thinking behind professional practice at a deeper level than the standard familiar tips was something teachers found difficult.*[7]

However, all the 'solutions' to the 'theory-practice problem' reported so far depended in essence on the replacement of one sort of 'given' theory by another: 'undifferentiated mush' by the disciplines of education; the disciplines by themes; disciplines and themes by a new 'grand theory' derived from empirical classroom studies; or constructed by 'raiding the disciplines', all these by a 'practical theory' created from the codification of teacher craft knowledge. In each case, however more or less relevant each might seem, the problem of actually *using* the theory as a basis for classroom action remained, since all offered 'recipe knowledge' at one stage removed from the particular way each student or teacher conceptualised his task.

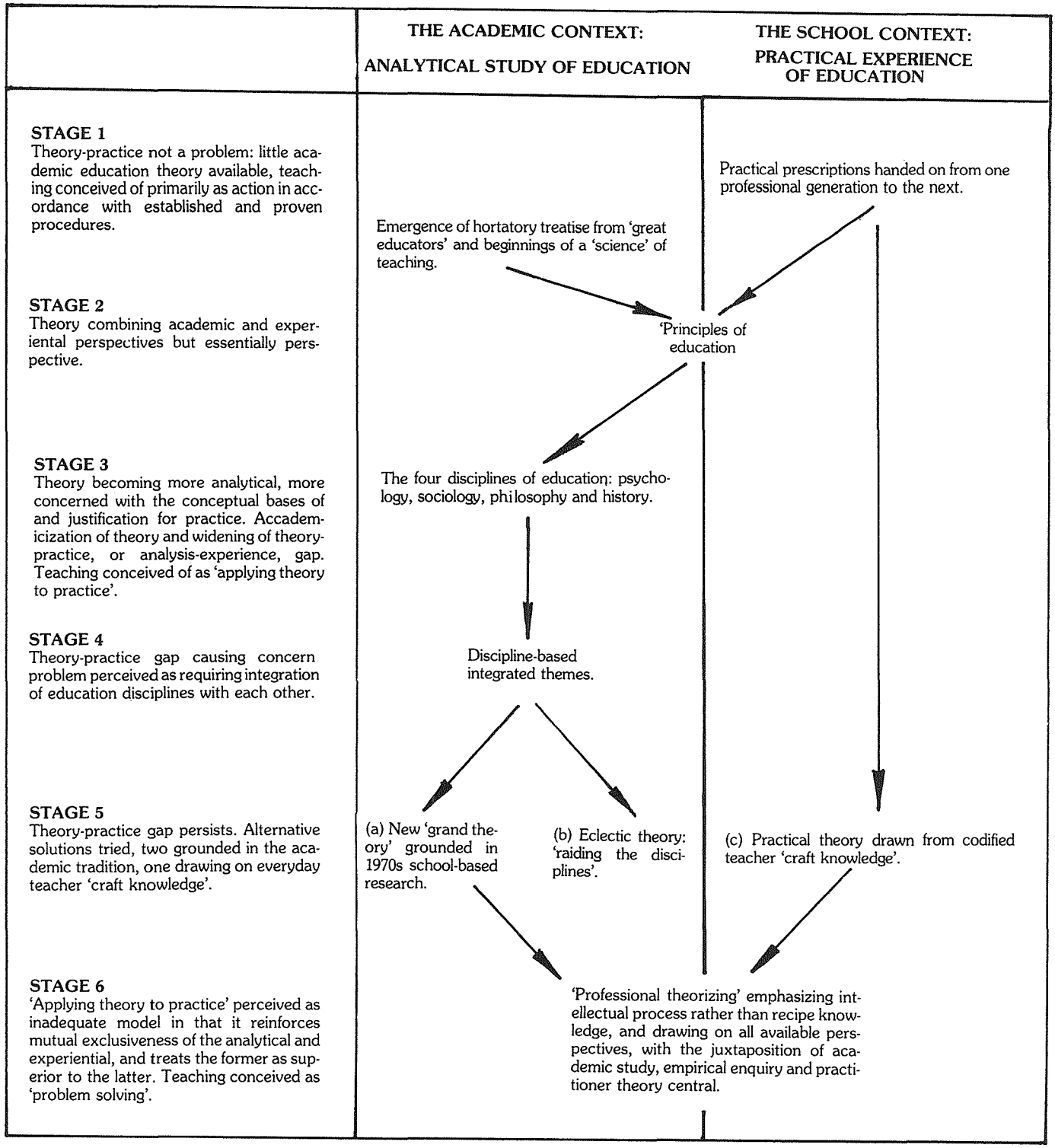
This realisation prompted others to argue that the task for teacher educators was to concentrate *less on what the student should know, more on how he might think.* The core of this further alternative was a notion of theory as intellectual process rather than as propositional knowledge: 'theorizing' or what Reid termed 'deliberation.' [8] But to achieve this demanded a shift, as McIntyre pointed out, from the competitive, individualistic and content-heavy approach intrinsic to mainstream British higher education towards a more communal, interactive style.

> 'The core of teacher education should involve students' gradual introduction to effective and detailed debate between practising teachers and those engaged in research on teaching from various perspectives.' [9]

McIntyre's analysis was grounded in a Popperian view of educational research, which contrasted with the explicit (or more often tacit and unrecognised) positivism underpinning the mainstream teacher education view of theory/practice. He argued that learning to teach must be a continual process of hypothesis-testing framed by detailed analysis of the values and practical constraints fundamental to teaching. The 'theory' for teacher education should therefore incorporate (i) speculative theory (ii) the findings of empirical research (iii) the craft knowledge of practising teachers, but non should be presented as having prescriptive implications for practice: instead, students should be encouraged to approach their own practice with the intention of testing hypothetical principles drawn from the consideration of these different types of knowledge. To aid this process *researchers would need to shift their emphasis to practitioners' concerns which would be identified on the basis of dialogue, participant observation and action research.*

We can now represent diagrammatically these developments, showing how the initiative for defining professional theory shifted from teachers to academics but could well now be moving back to what, arguably, is the ideal position: one which combines direct experiential analysis with more distanced objective critique, which incorporates both the academic and the experiential.

STAGES IN THE EVOLUTION OF A THEORY FOR TEACHING



At the moment Stage 6 lies ahead, or at least is more evident in individual practice than in institutional policy, but, overall, the British teacher education scene is characterised by diversity on this matter. Some courses illustrate Stage 3, many have moved to Stage 4, some are experimenting at Stage 5.

The 'theory practice problem' persists because we have not analysed it adequately. We have been too ready to take as given a particular definition of theory - the academic study of education through the disciplines of psychology, sociology, philosophy and history - and to then move on to seeing the problem as one of demonstrating the 'relevance' of this particular brand of theory, of helping the student to 'apply' this in the classroom. This has tended to lead us to ignore the existence of other sorts of professional theory, for example, the everyday 'theory in practice' which experienced teachers use; for I am not arguing against theory - far from it: teaching is intensely theoretical, it is based all the time on assumptions and values about children, learning, the purposes of education, the relationship between the individual in society, the nature of knowledge and its evolution in a context of social change, and so on. It is *the theory which we need to understand more about, for in the end this is the theory which has most impact on the children in our schools: the theory their teachers actually use as a basis for classroom decisions, rather than the theory we would like them to use.* The more we try and make the one sort of theory, academic education theory, 'relevant', the more we are in danger of doing precisely the opposite of what we intend, namely not unifying theory and practice but driving a wedge between them or rather between academic theory and everyday theory. If we are serious about our concern to solve this problem we simply cannot leave the actual theorising of teachers out of the equation. Our task has to be to help the student to theorise for himself, for he will have to do that as a teacher, using such pre-existing theory as is available and best meets his needs, comparing it, contrasting it, using one as a basis for critique of another, exploring all sorts of conceptual possibilities, understanding that good teaching requires intellectual effort and the free exercise of the imagination as well as basic practical competence. We need a *dialectical* approach to professional theory, not a *recipe knowledge* approach. In such an approach academic education theory, research and everyday practitioner theory are all necessary. Without any one of these the theorising capacity of the student-teacher and the potential for educational progress in schools are diminished.

Such an approach demands as much from the teaching profession as it does from the teacher trainers. It demands in the first instance an acceptance both that teaching is ipso facto; 'theory-soaked' and that it requires in addition a conscious theorising effort. It demands an acknowledgement that academic theory and research have made and will continue to make vital contributions to educational progress and that the anti-intellectualist stance ('forget all that theory and get on with practical business of teaching') does no credit to a profession which is supposed to be concerned to foster the intellectual qualities of others. And it demands a preparedness in the teaching profession to take a responsible share in the education and training of its future members.

So for our alternative analysis of the theory-practice problem I would suggest that we see it as having not *one* but *six* aspects, as follows:

1. **Intellectual.** The theory-practice problem requires intellectual effort. It requires us to accept it as an intellectual challenge, not to be contended with handed-down ways of thinking about it. And it demands that we accept a view of the teachers task as intellectually as well as practically demanding.
2. **Conceptual/Epistemological.** Our intellectual effort must go into probing the existing concepts of 'theory', 'practice' and 'the theory/practice relationship'. And perhaps into trying to break away from obsession with this issue altogether, into a different way of asking the questions: What sort of intellectual capacities does the intending teacher need? What sort of professional knowledge? What sort of executive skills? What kinds of knowledge and understanding does the good teacher use? How can we tap these in initial training?.
3. **Attitudinal.** We need to look carefully at the attitudes to and assumptions about teacher training institutions and staff held by teachers in schools. If these conflict, why is this? If there is an element of mutual suspicion, why is this? What can be done to resolve it? How can we work towards a greater unity of attitude towards the task of teacher training? For there is no doubt that an attitudinal gap, where it exists, simply reinforces conceptual gaps between theory and practice, and especially there is no doubt that a lack of attitudinal unity between teachers and trainers is against the best interest of the student.
4. **Structural.** *The theory-practice problem has persisted in part because of the persistence of*

deep structural divisions within teacher training courses, which go back in some cases to the nineteenth century and a wholly different concept of education; between academic or main subject studies and professional studies; between so-called 'personal' and 'professional' education; between education theory courses and curriculum or professional courses; between all these and teaching practice and other work in schools. How can we reduce such structural divisions? How can we ensure that the messages conveyed by different parts of a course are consistent and complementary, rather than contradictory?

5. **Pedagogical.** The student's knowledge and understanding of teaching, his way of thinking about, approaching and solving practical classroom challenges, depend as much on everyday pedagogical relationships between himself and his tutors and the teachers in practice schools as upon larger course structures. Or, aphoristically, as much on *how* he is taught as *what* he is taught. We need to examine afresh the pedagogy not only of schools, but of teacher education itself. What kind of learning does it produce? Are the teaching methods and tutor-student relationships in the training institution consistent with whatever view of 'good professional practice' we want the student to acquire? Are they the best examplars of such good practice that we can offer?

6. **Institutional.** Course structures reflect institutional divisions and staff allegiances to different academic traditions which they may have a vestd interest, for career reasons, in seeking to preserve. Are such divisions within the training institutions working *for* the student's capacity to develop professional understanding and skill, or *against* it? And what of the greatest institutional contribution to the theory-practice problem, the gulf between training institutions and schools? The two sorts of institution are financially and administratively separate, they have different career structures, in Britain staff are as yet rarely exchanged between them, and above all they may seem to represent to the student two distinct and sometimes conflicting ways of thinking about and preparing for teaching: one needed in order to pass examinations, the other needed to survive on teaching practice; each liable to be criticised by proponents of the other. At worst the relationship is one of mutual undermining rather than mutual reinforcement.

Thus, although I have argued that the theory-practice problem is intellectual, conceptual, attitudinal, structural and pedagogical, the best point of impact for achieving change at these levels would seem to be institutional roles and relationships. For this reason I would see potential in attempts, such as are emerging in Britain, to blur boundaries between training institutions and schools, between trainers and teachers, and between initial and in-service training.

'Theory-practice' as conceptual dichotomy is hard to resolve, but as institutional practice it is avoidable.

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The Psychology of Errors

Paul A. Bartolo

One of the lasting contributions to psychology by Sigmund Freud and Jean Piaget has been their focus on human errors as keys to the workings of the mind.

Freud dedicated two of his first lectures of *A general introduction to psychoanalysis* (1935) to "The Psychology of Errors". He considered slips of the tongue, misreading and the forgetting of resolutions as related to unconscious mental processes. Hence the expression "a Freudian slip". Similarly Piaget did not follow the developers of intelligence tests who focused on those tasks which most children could solve at progressive ages, but turned his attention instead to those tasks which most children at any given age invariably failed to solve. He based his theory of stages in children's intellectual development on their errors in dealing with problems that required a level of thinking beyond their particular level of development (see e.g. Piaget, 1954).

Whatever our view of them,there is no doubt that mistakes are a very common feature of our lives. We generally adopt the common attitude to them that helps us defend ourselves from feeling incompetent or discouraged in our endeavours, expressed in the sayings of *Humanum est errare* - (to err is human) - or *Bl-iżbalji titgħallem* - (we learn through mistakes).

While the first Latin maxim is merely a defence approach, the latter Maltese saying points to a different approach that could be very useful if adopted from the psychological point of view. The psychological approach can help us to understand the workings of our mind or that of others and thus serve as a solid foundation for improving our own or others' understanding and coping better with our problems.

For instance, a young man who from a distance mistakes another person for his lover, can regard his mistake as an indication of the degree of his involvement with his girl friend. Similarly a student who fails to solve a problem correctly, may discover at what point his reasoning, i.e. his mental functioning, did not match the real issues and thereby be able to adjust his internal processing to better match the real factors in the problem. These same mistakes can be of great value to the counsellor or teacher who is trying to help his client or pupil to come to terms with his problem.

The teacher should in fact be fascinated by the mistakes of his pupils. It is through mistakes that he can best come in clear contact with the workings of the mind of his pupils whose thinking he is trying to help improve.

Mistakes and errors

One might assume that there are no 'accidental' mistakes - or to put it differently that every mistake can be explained as a conscious or unconscious process in one's mind. On the other hand it is fruitful for educators to distinguish between two types of mistakes. A learner sometimes commits a *random mistake* or a mistake that is the result of some kind of failure in his mental functioning. For instance, one who has the understanding and ability to add single digit figures may occasionally make a mistake in one of his additions.

In contrast to this, a learner may make a *systematic* mistake, which for our purpose may be termed an error, that is the result of a failure to understand the principles involved in the solution of a particular problem. For instance, in the subtraction of double digit figures a boy or girl may sytematically subtract the smaller number from the bigger one without taking account of which should in fact be subtracted from which. Note that in this case the child is actually applying the elementary mathematical rule that only the smaller amount can be subtracted from the larger to give a positive result; but he is not yet aware of the more advanced principle that allows a negative result or that requires borrowing from the next higher unit.

These insights have been extended to all areas of psychology including the psychology of language. The type of errors children make in acquiring language are clear evidence that they process internally the language they hear according to the systems they develop in their brains. For instance, it is now common knowledge that when a child says "Father *buyed* it for me" instead of *bought,* or *Il-barmili* instead of *Il-bramel,* he is not making a random mistake but rather a systematic error of applying his recently discovered language rules (of how to form a past tense verb in English or the plural form of a noun in Maltese) to express the desired meaning (cf. Corder, 1967; Deutsch (ed.), 1981.

Errors indicate developmental stages

The discovery of such systematic errors is also being used to determine more adequately the essential underlying factors of children's intellectual development. Taking their cue from Piaget's work, cognitive developmental psychologists have been devising tasks that reveal the rules children construct or are able to construct at different ages to deal with school and other problems.

One such interesting task, first used by Piaget, is that of predicting which side of a balance beam will go down when various combinations of weights are placed at various distances from the fulcrum. Siegler (1976) found that children at ages 3 or 4 make a very global evaluation of each side, often based on salient perceptual characteristics of the weights; at the age of $4^1/_2$ to 6, they carefully add the number of weights on each side, and pick the one with the greater number; at ages 7 or 8, if the number of weights on each side is equal, children will predict that the weight which is at a greater distance from the fulcrum will go down. At age 9 or 10, children succeed in working out some kind of compensation between weight and distance on both sides. Case (1978 and in press), through experimental testing and instruction, has found that children's ability to take account of more and more dimensions of a problem at various stages of their middle childhood ($4^1/_2$ to 10 years) is related to their developing short-term-storage-space (STSS) (i.e. mental capacity to process various units of information simultaneously in one's mind) which seems to go on expanding until the age of around 15. Thus, at the four substages of their dimensional development in middle childhood, children are able to evaluate *simultaneously* the global features of the balance beam problem, then to quantify and compare wieghts, then to take account of and later also to evaluate the relation between quantified distance from the fulcrum as well as quantified wieght.

In contrast to Piaget, who was primarily concerned with discovering *structural* stages in intellectual development, Case has focussed on the *functional* aspects of the theory. He has subsequently come up with a new applied theory of intellectual development that seeks to establish criteria for the optimisation of the educational environment for children's intellectual development.

Through the analysis of children's errors in dealing with tasks within or outside the school curriculum, it is gradually becoming possible to determine their particular demands on the STSS of students and at which level of difficulty these tasks may be understood and worked out by the various students. We will thus be able to avoid frustrating our students with unnecessary failures while at the same time optimising the use of their capacity.

Even without the technical measuring of children's STSS, the above developmental theory suggests that there is a 'natural' sequence in which children learn to deal with the various tasks they come across. Therefore, if we can reveal such specific sequences we will be able to more effectively promote our students' transition from any given stage to the next higher level of understanding of a task. Evidence of such effectiveness is already available, for instance, in reading (e.g. Dewsbury *et al.* 1983).

Both in discovering such developmental criteria as well as in assessing the developmental stage of a child in dealing with any particular problem, error analysis is an essential tool. Educators should be trained to appreciate the psychology of errors, as some teachers already do spontaneously, to modify their instruction and tune in to the intellectual functioning of the individual student.

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Continued from Page 15

Whichever type of questionnaire is used this should enable the researcher to collect data not only on the teaching methods but also on classroom and curricular organisation, discipline, testing, marking and so on (e.g. Bennett, 1976). In developing the questionnaire the researcher should ensure that the questions are not ambiguous (that is, that the instrument is reliable), through successive piloting in the field (Kerlinger, 1964), and even with knowledgeable individuals. Piloting could also reveal questions which should have been asked but were initially overlooked. Pre-coded answers would make the instrument more "efficient" in the sense that one knows beforehand what type of answers are to be expected, and pre-

coding would be amenable for transfer on computer cards for ease of storage and retrieval (Cohen & Manion, 1980). Moreover, questions which require the teacher to answer from only two distinct categories should be avoided as these tend to force the individual to answer one way or the other even though she does not agree.

The self-administered questionnaire has two major shortcomings. First, one can never make certain that all the questions are completed (e.g. Davie et al. 1966). Second, not all the questionnaires are completed and returned. Even when a relatively high percentage are returned (like the 80% of returns in the Bennett survey, 1976; page 42), one would never know whether or not the teachers who declined to or did return the questionnaire share some common charcteristic which renders the sub-sample of returns unrepresentative in terms of one or more of the parameters under study.

One way of overcoming these problems is to opt for a structured interview (Kerlinger, 1964). This, however, apart from pre-testing in the field, would also involve the training of interviewers and the difficulty of finding the most convenient time for teachers when they can be interviewed. This would most probably involve more commitment on the teachers' part in terms of giving up part of their free time. For this reason, and in order to avoid having teachers not completing all the self-administered questionnaire because they get bored half-way through, the time taken to complete it should be reasonable.

A major problem arising from the use of questionnaires is that what one claims to do in the classroom is not always what one actually does - how one conceives oneself to be is not always compatible with what one really is. There is, of course, little that one can do in terms of improving the instrument or its administration procedure. The concurrent use of the observation schedule and the questionnaire/s, however, is one way of overcoming this problem and establishing some validity of the teaching methods and class behaviours observed and recorded.

Achievement measures

The choice of tests used to give a measure of the influence of teaching on pupil achievement is of crucial importance. As Galton & Simon (1980) point out, there are two issues in particular which require consideration: "the relevance of the measures to what teachers and schools are trying to accomplish and the extent to which they are equally appropriate to a variety of teachers and schools, when comparisons between them are being made" (page 45). One way of overcoming the problem of choosing appropriate instruments would be, according to Cheyne (1979), to use different types of assessment procedures like teacher-based assessment, standardised and non-standardised tests on the basic skills.

The pupils would have to be tested/assessed at least twice: at the beginning of the study (to give a measure of their initial abilities), and at the end. There will be, of course, a number of pupils who would miss some of the tests. Preferably, provisions should be made to avoid this sample loss by having these pupils tested on another occasion (the earliest the better). As in the Bennett survey (1976), it would be advisable that the teachers themselves should administer the tests under normal classroom conditions "to obviate a test atmosphere and, hopefully, to reduce anxiety" (page 80). Detailed instructions should be provided so as to limit differences in the administration of the tests (including time and day when these should be held).

Each method of assessment has its particular advantages and disadvantages. Teacher-based assessment, for instance, involves a high level of subjectivity. On the other hand, this measure is a true reflection of the objectives of the teacher or the school. Besides, teacher-based assessment could give an indication of pupil achievement not only on the basic skills but also on a wider choice of subjects (e.g. Davie et al., 1966).

Non-standardised tests may also be said to reflect the teacher's/school's objectives when these are involved in their construction. However, these criterion referenced attainment tests give rise to a number of disadvantages like variations in scoring procedures, and their reliability and validity. In fact, they should be tested for their reliability and validity on appropriate groups of children before their full administration on the sample (e.g. Galton & Simon, 1980).

Standardised achievement tests would overcome all these disadvantages. What is more, they enable the researcher to compare the achievement of pupils from different schools as well as with results from other investigations. On the other hand, as Berliner (1976) and Dunkin (1976) point out, standardised tests are "inadequate" since they only measure a limited range of content and because they are not likely to be based on, or match, the content which has been taught: they lack content validity at the classroom level. Moreover, since these tests are usually group administered multiple choice type, young or lower socio-economic status children can be at a disadvantage. Indeed, as Dunkin (1976) points out, in studies of teacher effectiveness, the influence of intelligence and ethnicity on test performance should be removed or at least diminished. One way of overcoming these problems is to refine the test items: choosing items which are reactive to teaching (by consulting teachers), and choosing items that correlate weekly with a measure of general intelligence (Dunkin, 1976).

Statistical Analysis and Interpretation

It is not the purpose of this paper to delve into the choice of appropriate statistical techniques like cluster analysis, analysis of variance and co-variance, regression and other multivariage analysis of data. What is pertinent, however, is to consider some major statistical issues and their implications for the final interpretation of results.

Most of the above-mentioned techniques are based on the assumption of normality, the homogeneity of variance, the continuity and equal interval of measures. The researcher has to decide whether to use parametric statistics (cf. Kirk, 1968) or non-parametric statistics (cf. Siegel, 1956). Some writers (e.g. Warburton & Southgate, 1969) argue that the use of "crude" non-parametric techniques is not justified, even when the data is "fallible" (e.g. small amounts of data, biased data). Lewis (1967), moreover, asserts that the standard techniques are powerful and robust enough to hold in most cases, even when the above assumptions are violated.

Statistical inference would essentially be based on the statistical significance of results. The researcher can opt for a conservative interpretation of results by rejecting null hypotheses at the 0.01 level (e.g. Pringle et al., 1966) or 0.001 level instead of at the 0.05 level or lower. One must bear in mind, however, that in educational research a result may be statistically significant but not important (Warburton & Southgate, 1969). On the other hand, mean gain in attainment, for instance, under teaching style I may be only marginally greater than that under teaching styles II & III. Even though this result is not statistically significant it could have educational significance. Concomittant with this there is also the issue of generalizability of findings. An interpretation may be legitimate in the present sample but not so in the population.

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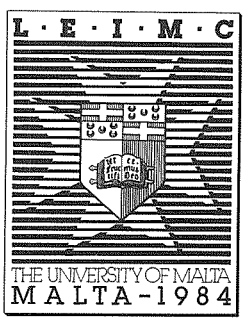
Issues and Events

Conference on Lifelong Education Initiatives in Mediterranean Countries

Between the 5th and 7th November, 1984, the Faculty of Education at The University of Malta held a Unesco sponsored conference on Lifelong Education Initiatives in Mediterranean Countries at the Hotel Phoenicia.



The conference, which was chaired by Kenneth Wain, who also opened it officially, brought together an international and local audience, which was addressed by six specially invited speakers from different Mediterranean countries, and by others who read short communications. The six invited speakers were Ettore Gelpi from Unesco (Paris), who read a paper on Lifelong Education and International Relations. Alberto Melo, from Portugal, whose contribution dealt with the transition *From Traditional Cultures to Adult Education: The Portuguese Experience after 1974*. Joan Bofill, whose paper about *People's Participation in Education* dealt with the general issue related to its title, as well as with the efforts of the Barcellona community, to which he belongs, to find some answers. Asher Deleon from Yugoslavia who dwelt on the *Relations between Education and Communication* in a paper which was, in many ways, complementary to that of Bofill. George Papandreou from Greece, who described the experiences of a country which was seeking a form of "education for liberation" after a period of dictatorship, and which found this new approaches to *"Individual and Collective Self-Learning."* And Mustapha Haddab, whose paper on *"Lifelong Education and Social Resistance"*, described how lifelong education policies can be opposed and distorted, taking his own country, Algeria, as a case study.

Among the short communications a popular theme concerned the role of the university in the contemporary world and as an agent of lifelong education. It was addressed by the three American speakers; Darlene Weingand whose specific interest was in *Continuing Education and Telecommunication,* and Charles Madden who described the experiences of Webster University in his paper on *The Adult Learner: the neglected ingredient,* and Harold Luneau whose account of *A Developmental History of Lifelong Education at an American Urban University* concerned the expansion of the "outreach" programme of the University of Arkansas. And it was also the subject of Prof. France Vreg, from the University of Lubljana, in Yugoslavia, whose paper on *The Implications of contemporary Scientific and Technological Changes for Society and Lifelong Education,* dealt with the reforms in Yugoslav universities to meet with the phenomenon indicated by his title.

Other interesting papers that gave the conference the breadth of scope which constituted one of the factors that appealed to the participants, who came from different backgrounds, social and professional, were that of Maurizio Lichtner, from Italy with a paper on *Project Evaluation in Adult Basic Education,* Mohammed Tahririan, (Iran), *School Curriculum and Students' Educational Needs,* Harikesh Singh, (India), *Education and Rural Development* and Emmanuel Adima (Nigeria), *Lifelong Education and the Handicapped.*

There was also a good local participation. Two papers came from the Workers' Participation Development Centre, at the University, and were read by Godfrey Baldacchino, and Saviour Rizzo, who spoke respectively about *Workers' Education for Effective Participation* and *Workers' Education as a Key in the Search for New Formulas.* The others came from Ugo Mifsud Bonnici, who spoke about *Knowledge and Power* and Evarist Bartolo, about *Cultural Action for Self-Management.*

The conference was an intense, one could add tiring, experience for those who participated. A great deal of discussion marked all the occassions and spilled outside. At the plenary session which closed the proceedings, a motion was proposed by the Chairman on his own behalf and on behalf of Melo, Deleon, Haddab, Gelpi, Bofill, and Papandreou, and passed, that efforts be made to hold another meeting in Malta in two years time, on the narrower theme of *Lifelong Education and Employment Issues.*

Kenneth Wain

Conference on Pirandello

"A teatro con Pirandello" was the theme of the 16th. International Congress of Pirandellian Studies held between April 26 and 28. The congress was organised by the University of Malta and the National Congress of Pirandellian Studies, in collaboration with the Italian Cultural Institute and under the patronage of the Assessorato Beni Culturali, Ambientali, e Pubblica Istruzione of the Sicilian Region.

Prof. George P. Xuereb, Rector of the University, welcomed and thanked scholars from various Italian universities who had accepted to participate in the congress. Whereas during last year's Pirandello congress the papers presented were largely the work of Maltese scholars who had discussed a wide spectrum of the author's works, this year's theme was a more specific one - his dramatic projection. Prof. Xuereb thanked the Centro Nazionale di Studi Pirandelliani, especially Prof. Enzo Lauretta, of Agrigento for publishing last year's conference papers.

The papers read were: Nino Borsellino (Il teatro di Pirandello); Claudio Vicentini (La poetica drammatica di Pirandello); Sarah Zappulla Muscara and Egle Palazzolo (Il berretto a sonagli, testo e messinscena).

On the second day of the congress the following papers were read: Lucio Lugnani (Enrico IV); Roberto Tessari (Sei personaggi in cerca d'autore); Nino Borsellino (Questa sera si recita a soggetto); Roberto Alonge (I giganti della montagna).

This year's novelty of the conference was the production of the play "Il berretto a sonagli" by the Piccolo Teatro Pirandelliano of Agrigento at the University's Assembly Hall.

Siculo-Maltese Congress in Catania

A number of Maltese and Italian scholars took part in a congress at the University of Catania between May 3 and 5 about the linguistic and cultural relationships between Sicily and Malta.

The congress was held on the initiative of Prof. G. Soravia. Although the accent was predominantly linguistic (Aquilina, Brincat, Cassola, Soravia, Varvaro), a wider spectrum was covered by papers on archaeology (Bonanno), folklore (Cassar Pullicino), literature (Eynaud, Friggieri, Lanza) and history (Alfieri, Mangion, Mazzon).

Seminar on the History of Italian Language post Unification

Prof. Ignazio Baldelli of Rome University conducted a seminar on "Storia della lingua italiana dall Unità ai giorni nostri" during the month of March for teachers and students. The seminar formed part of the course work for B.Ed (Hons) students specializing in Italian. Prof. Baldelli, a well known linguist, dealt with the linguistic problems in Italy just after Unification. Prof. Baldelli was later joined by Prof. Alberto Mazzetti (Pro-Rector of Perugia University). As a result of this seminar and through the Italo-Maltese cultural agreement five final year students were awarded a scholarship in Perugia as a continuation of their course and to update themselves in the teaching of Italian as a foreign language.

Seminar on Manzoni and Romanticism

To mark the second centenary of the birth of Alessandro Manzoni, Prof. Mario Puppo was invited to conduct a seminar on "Manzoni e il romanticismo" for B.Ed(Hons) students in their 3rd. and 4th. year. Prof. Puppo is a reknowned historian of Italian Literature and critic. His main works comprise studies on Italian authors such as Croce, Foscolo, Leopardi and Manzoni.

Seminar on the teaching of Italian

Prof. Katerin Katerinov of the University of Perugia conducted a one week seminar on "L'insegnamento dell'italiano come lingua straniera" for teachers and B.Ed(Hons) students. The lectures comprised:

i. Cultura e civiltà nei corsi di lingua;
ii. Dalla grammatica normativa alla grammatica didattica;
iii. L approccio comunicativo nei metodi nozionali-funzionali.

The seminars and conferences organised by the Faculty of Education are in line with the contacts that the Faculty is making with Italian Universities through the collaboration of the Italian Cultural Institute. Co-ordinators are Dr. J. Eynaud and Rev. Dr. A. Sammut.

Joseph Eynaud

Assessment of Teachers

There is a controversy in Britain at the moment over the issue of the assessment of teachers. On the one hand the Government wants to ensure that teachers do their duty and perform satisfactorily, and to check this, they should be assesed annually. On the other hand Teachers' Unions are opposing proposals for this assessment and the withholding of increments from those who fail to reach a satisfactory level of performance. Mainly the teacher's opposition stems from the worry about who the assessors will be and what should go into a teacher appraisal scheme.

Local education authorities are proposing that the teacher to be assessed will discuss with his senior colleague, to whom he is accountable, "opportunities for and obstacles to" improved performance and for "professional development", under the supervision of the L.E.A.'s inspectorate. The discussion will be conducted according to a nationally agreed "prompt sheet" and information will be recorded in a "performance appraisal form". The teacher will have the right to read the assessor's overall summary and add to it any brief comment or reservation considered necessary. These records are always kept confidential.

Proposals for an assessment scheme itemize a number of duties and responsibilities regarding such areas as classroom practice, liaison with colleagues and sharing responsibility for the running of the school. The Professional Association of Teachers supports these proposals because, as Peter Dawson, its general secretary asks, "What has the competent and conscientious teacher to fear from such an arrangement?" It also accepts the principle that the duties and obligations of teachers "should be contractually laid down so that there can be no more argument about what may or may not be expected", (Dawson P., *Why not link performance and pay?* Times Educational supplement, 30.11.84), writes Peter Dawson.

On the other hand, teachers' unions are concerned that much evaluations will become more bureaucratic chores, that can be used, however, by officials to put administrative pressure on teachers, and not to ensure academic excellence as government claims. The debate rages on.

Teacher specialists in Primary Schools

Recently the M.U.T. general secretary stated that the teachers' union is proposing tht a form of specialist teaching should be introduced as from Year 3 in Primary Schools. The union is suggesting that there will be four teachers with every three classes.

The introduction of specialist teaching in Primary Schools is an issue which is being hotly debated at the moment in the Chief H.M.I Eric Bolton and echoed in the H.M.I. discusssion paper *Teaching in Schools: The Context of Initial Training.* It is justified by the belief that pupils make more progress in the various areas of the curriculum and standards are also raised.

A recent report, The Thomas Report, 1985, *Improving Primary Schools,* prepared by a committee of parents, governors, teachers and other professionals under the chairmanship of Norman Thomas, former Chief H.M.I for primary education has come out against such a view. It specifically states that "Every registration class should have a Teacher who is responsible for seeing that the work of the class is coordinated and coherent and should teach all or most of it."

If left in the hands of specialists, the primary curriculum can become fragmented and incoherent. However, the report admits that subjects need to be taught in greater depth, and, therefore, it recommends that provision will be made so that the teacher responsible for the class may obtain expert advice from other members of the staff. This implies that the particular school will have to use its staff resources to develop work in the curriculum.

Dress neatly and smile

To advise a teacher to dress neatly in class may indicate an outmoded view nowadays. However, this is not what the National Association of Schoolmasters/Union of Women teachers and the National Union of Students think. In a booklet, *An education student's guide to teaching practice,* just published the unions advise student teachers to go to class immaculately dressed because "an immaculate standard of appearance would imply you will also have a high expectation of standard of behaviour and a scruffy appearance could imply an acceptance of low standards". This advice is addressed especially to those students who show lack of confidence when confronted by a class.

Children's behaviour can also be influenced by the type of smile the teacher puts on according to an inservice training booklet compiled by Kingston Polytechnic. Pupils will receive signs of fear and give the teacher more trouble when he smiles fixedly "showing upper teeth, head down, eyes looking up". On the other hand, a "meeting-of-friends-smile with a quick lift and drop of the eyebrows" will convey the message that the teacher likes the pupils and makes them feel significant.

National Conference on Education

Mr. Joe Pirotta, Dr. Kenneth Wain and Dr. Godfrey Wettinger, lecturers in the Faculty of Education, were among the speakers who addressed the three-day conference on Education in Malta organized by the Nationalist Party and held at the University last February.

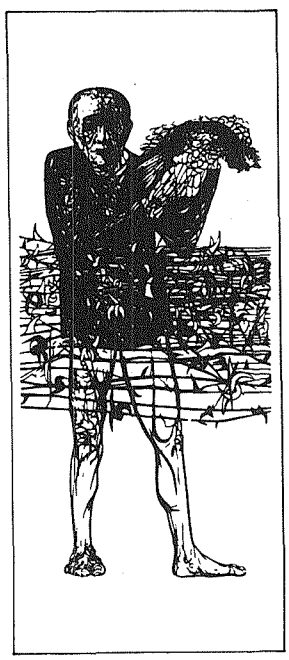
Mr. Pirotta spoke about the influence of the B.Ed. (Hons) course on the teaching profession. The speaker considered it important that, for the first time, teacher education in Malta was raised to degree level, consequently enhancing the professional status of teachers. The recent appointment of casual teachers in both Primary and Secondary Schools is detrimental to the teaching profession, the speaker stated. In his conclusion the speaker reviewed that recent commitments of the Faculty and made suggestions about what could be done as a result of further cooperation between the Department of Education and the Faculty.

In his paper, Dr. Wain argued that schooling should form part of the more comprehensive process of lifelong education. It should be part of the policy of the school, therefore, to equip individuals with the knowledge and skills so that, eventually, they could direct their own learning. Acceptance of this principle would have far-reaching educational implications. The speaker passed on to discuss briefly a school programme with a focus on the need of self-directed learning and the skills that the self-directed learner ought to acquire.

Dr. Wettinger addressed the question, "How long can a University survive without the teaching of the humanities, pure science and research?". He cast a sweeping look at the development of universities as institutions of higher learning from Graeco-Roman to recent times. The speaker argued that when universities assumed a purely utilitarian role (and here the seventh and eight centuries were singled out) higher learning withered in these institutions and began to sprout elsewhere. Utility, the speaker added, must not only be seen as fulfilling the needs of governments but also those of the individual. Research, the speaker concluded, should form part of the university life.

The conference, which spanned over three days, addressed issues under three broad headings, namely, Private and Government Schools in Malta, What is happening in Government Schools and Education for Life.

Week of American Culture



The University of Malta organized a week of American Culture between 13 and 18 May at the Assembly Hall of the University. The purpose behind it was to promote international communication through art, literature, film and music. As the Rector wrote in the Foreword to the programme, "It is this cross cultural flow that helps shore national dignity, relevance and peace solidly based on understanding."

Her Excellency Miss Agatha Barbara, President of the Republic, opened the activities with a Woodcut Exhibition entitled "Revival and Innovation," on 6 May. Other activities included film shows, lectures on aspects of American Literature, the art of print-making and film-forum. There was also a jazz concert and the play "Seduced", by the contemporary American playwright, Sam Shephard.

Daniel Massa, Anthony M. Schembri, Carol Levy, Marisa Calleja and Rosella Schembri formed the Organizing Committee.

Joseph Fenech

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