# Singapore Journal of EDUCATION

1984 Vol. 6 No. 2

Institute of Education

# Editorial Board




469 Bukit Timah
Singapore 1025

The *Singapore Journal of Education*
is published for the
Institute of Education, Singapore by
Federal Publications (S) Pte Ltd
2 Jurong Port Road, Singapore 2261.
The Journal is intended to promote interest in education and to provide a channel for discussion and research in education.
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The Editorial Board welcomes contributions on educational developments, issues, pedagogy, research and related aspects. Articles, book reviews, research papers, etc., are welcome. All manuscripts should be typed with double spacing and submitted in duplicate to the Executive Editor, Singapore Journal of Education, Institute of Education, 469 Bukit Timah, Singapore 1025.

ISSN 01 29-4776

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GUEST EDITORIAL

# Research, Teacher Education and Teaching

*Dr. Eng Soo Peck (DD/Academic)*

A deep chasm exists between the educational research community and the educational practitioners. There has been much talk about the need to bridge that chasm so that practitioners may have access to the research wisdom generated to help inform and improve practice. It would be fair to say that some attempts have been made, but these have been desultory and today educational practitioners are no better informed about the knowledge ago. The research output in the last two and a half decades has been phenomenal, and the volume itself daunting, to say the least, even to those few practitioners who have been initiated into the mysteries of educational research.

Admittedly, the locale of educational research itself creates the kinds of research that seem esoteric and exotic for the school-based practitioner who has to wrestle with variables that researchers seem either oblivious to or not interested in. The possibility of practical application to be derived from the researcher's findings seems furthest from the mind of the researcher. He speaks not to the school practitioner but to the research community in academia; he researches not with the main objective that his research findings will find a useful place in the classroom or school but to gain a niche in the pecking order of the research community. As such he conforms to the conventional norms of research excellence in the world of the social sciences, borrowing his paradigms and methodology from that world and couches his findings in a language register totally alien to the practitioner.

The point to be made is not that such research is not useful or usable. The point is that much of the "wheat" of research, assuming that the "chaff" has been separated out, is non-accessible to educational practitioners who rightfully should be the main audience of educational researchers. The day when this should be so is still far off. Meanwhile, the world of the educational researcher and the practitioner will remain apart, each not being able to speak to the other. The practitioner will continue to use unquestioned conventional wisdom in teaching practice whilst researchers will continue to be absorbed in problems and issues of the day that are researchable and in using ever more elegant models that have not one iota of impact on what goes on in schools.

The prevailing mood towards education in schools and teacher education is not positive, to put it mildly. Teaching and teacher education depend too much on conventional wisdom or common sense as though both activities do not have a knowledge and skill base derived from research. As pointed out earlier, the problem lies in the apparently unbridgeable gap between research in education and the realities of teaching practice. That gap must be closed so that teacher education and teaching practice in schools may be research-based, that practice may be rationally defensible and schools be made less vulnerable to fads and fashions. That, as I see it, is the only way to mute criticism directed at the educational enterprise which will then be able to operate at the frontier of the state of the art.

A "brokerage" system is suggested to bridge the gap between research and practice. Whilst others may fill the bill as broker, it is suggested that teacher educators are perhaps best positioned to play that key role. The teacher educator straddles two worlds, or he should be trained to be: the world of research and that of practice teaching. Minimally, he must be able to make sense of research reports and translate findings into guidelines for practice, recognizing that educational research findings are never prescriptive and are generously peppered with limitations and caveats. Ideally, he must be actively engaged in research himself and, in the long haul if at all possible, use paradigms and models closer to the school world rather than those used in the social sciences. Active engagement in research increases the probability of commitment to the knowledge base generated by other researchers.

Admittedly, research in teacher education pales into insignificance when compared with the voluminous literature on teaching and learning in the schools. But a distinction must be made between teaching in the schools and teaching prospective teacher how to teach. The knowlegde and skill base generated by research in teacher education is small but nevertheless usable and useful. With the increasing attention being paid to teacher education, particularly in the USA, the volume of research in this area will increase manifold. Now is the time to install the "broker" system to sift through the expected increasing knowledge and skill base on teacher education and to use that base to inform the organizational and programmatic aspects of teacher education.

In addition to acting as brokers or mediators between the research community and the practising teacher, teacher education institutions would do well to embark on research that focuses on activities that go on within the institution itself. Teaching others how to teach would carry greater credibility if the teaching that goes on and the programmes implemented in teacher education institutions reflect the state of the art in the relevant areas. To this end, the Institute of Education (IE) takes the first step in its commitment to research-based knowledge to provide principles and guidelines for self-renewal. Four IE wide research projects have been identified covering the broad spectrum of teacher education from selection to post-graduation performance in the schools. The first research project seeks to ascertain the relationship, if any, between entry characteristics of prospective teachers and performance within IE; the second focuses on performance of these teachers post graduation and its relationship to performance within IE; the third, crucial to the success of the two projects, focuses on the reliability and validity of performance assessments in the various courses offered to prospective teachers, while the fourth seeks to discover the effectiveness of different approaches in the preparation of prospective teachers. The four projects represent a substantial commitment of resources to research, justifiable on the grounds that research knowledge must replace folklore and conventional wisdom.

Lest the above mislead the readers into thinking that teaching is a science and that a research-based teacher education is the adequate answer to producing effective teachers, let me hasten to add that the art side to teaching is just as real and not to be forgotten. No apology is needed if teaching turns out to be both science and art. Medical practice too is compounded of both science and art. Whilst the science aspect of medicine is taught, the "feel" for medicine is also developed. Indeed, everything being equal, it is this "feel" which distinquishes between a great and a mediocre medical practitioner. Similarly with teaching: the scientific base of teaching provides the reference point and the "feel" for teaching makes the difference between a great teacher and a mediocre one. ■

# The Concept of Educational Disadvantage and Some Implications for the Classroom Teacher*

*Hugh Philp*

I should like to talk to you about a matter which was a great concern to Ruth Wong, as it is to me — the question of what 'education', in the broad sense, can or should do to alleviate the plight of the many millions of the world's children, who, for one reason or another, are unlikely to live full, healthy, productive and happy lives as their more fortunate fellows. 'Disadvantage' has been interpreted in many ways. Indeed, each of us has his or her own concept of what constitutes the term, just as each of us has personal ideas about ways of eliminating or minimizing its effects. What I have to say represents my own feelings and opinions. I hope you will forgive me if I begin with some general ideas, one or two of which may seem a little academic, but I think it is important to be clear as a great deal of damage has been done because of confusion of thinking.

Let me first nail my colours to the mast. My concern is with children as children. I believe that programmes for the prevention, elimination, minimization or alleviation of disadvantage, as described and defined in the way I propose to use the term, should be designed specifically for children as individuals in terms of the nature of their specific disadvantage rather than for institutions or social groups. That is, I shall not talk about 'disadvantaged schools', 'disadvantaged minorities', 'disadvantaged social classes' and so on. I consider that institutionally directed programmes rather than child-centred ones tend to fail. Let me repeat — I plan to talk about 'disadvantaged children' and about some aspects of educational programmes for them. One further point is that I would not wish to suggest that 'education' is the answer to all the problems of disadvantaged children. My own view is that carefully integrated programmes must be developed, programmes which will consider ways of improving health, nutrition, sanitation, water supply and, obviously enough, of minimizing poverty. Education is both an end in itself and a major strategy for attaining other ends. To improve health or nutrition, for example, implies programmes to educate the communities and families. But that is another set of issues; our present concern is with the role of education in improving the quality of life of disadvantaged children.

'Disadvantage' implies a lack, a negative quality or attribute of some kind as a result of which children are unable to achieve their greatest potential, either in terms of their own individual development or in relation to meeting the needs of their own societies. This carries the connotation of relativity: children are 'disadvantaged' in comparison with other children, either in the same society or culture or, on some kind of absolute scale, with all children everywhere. In this sense the concept is linked with that of 'equality of opportunity'. The disadvantaged child is less likely to have equal opportunity of access to educational facilities. In addition or alternatively, he or she may also be less likely to be able to make full use of those facilities even when access is available. As a direct consequence, disadvantage becomes cumulative.

The assumption is that because of their disadvantage, whatever that may mean, such children are less likely to achieve their innate potential in general. There is often a further assumption that the factors which are thought to contribute to 'disadvantage' have universal meanings irrespective of the nature of the culture, the society and the environment in which the child grows up. This may well be challenged. A background which leads to 'disadvantage' for certain purposes may be perfectly adequate and indeed facilitating in other circumstances. To take a specific case, the cognitive skills of many children living in the developing countries are frequently 'inadequate' (or rather, inappropriate) for understanding and manipulating many of the concepts normally used in a standard Western school curriculum. On the other hand,

* This article is the text of the second Ruth Wong Memorial Lecture delivered at the National University of Singapore on 23 March 1984.

they are more than adequate — indeed they are essential — to enable the children to live in, work with and manipulate the environment in which they grow up. These questions must always be asked: In what circumstances, are they inadequate? In relation to whom are they disadvantaged? What are the purposes in doing this?

The notion that social and cultural backgrounds may in themselves be impediments to optimal individual development is also open to question. This view has been almost by definition the standard assumption of all 'compensatory' or 'preventive' early childhood education programmes. It was the mainspring of 'Head Start' (Zigler and Valentine, 1979), from which a great deal of subsequent planning for early childhood education has been derived. It has been challenged, particularly by scholars such as Labov (1970) and Ginsberg (1972) who have argued, with solid research data, that even in 'advanced' industrialized societies, children are able to fulfil their innate potential within their own specific cultures or sub-cultures. The fact that a child is unable to cope with a school situation, dominated by a structure, a curriculum and a language 'foreign' to him, does not mean that he has not reached or cannot reach a high level of performance within his/her own natural environment and background.

Nonetheless, most discussions of disadvantage have accepted the proposition that 'inadequate backgrounds' lead to disadvantage or deficit or both, which can be prevented or compensated for by appropriate action. It is fair to say that international agencies, in general, have also accepted the philosophy of these assumptions.

There is therefore some need to clarify what is meant by words like 'disadvantage', 'deficit, 'deprivation', and 'difference', words which are used frequently in discussions and which have guided a great deal of the work of international agencies and national governments.

In general the definitions have been couched essentially in pragmatic and educational terms, related on the one hand to ideas about the needs of children and youth, and on the other to societal goals within the individual community and the groups in which any programme is working. A great deal of the argument about the meanings of these words in professional as well as lay literature have been semantic: many of them have confused causes with effects, and this has in turn influenced the ways efforts have been directed to prevent or overcome the consequences, if any, of the four 'Ds' difference, deprivation, deficit and disadvantage. Robinson discusses the semantic issues clearly and persuasively, arguing 'that a little more consideration to the meanings of 'difference' and 'deficit' might have saved everyone some trouble.' (Robinson, 1975.)

Much of the confusion has arisen because the issues have been presented in social or educational terms, whereas many of the theoretical arguments have been posited and the experiments carried out by linguists, sociologists and psychologists who have not, for the most part, been concerned with the practical implications, let alone the implementation of their theories and laboratory experiments. Nor, for that matter, has there been adequate feedback to psychologists, sociologists and linguists from the field situations, in particular, there has been a paucity of good comparative data.

An operational definition of 'disadvantage', in so far as it affects formal education, was posed most precisely for Unesco by Passow (1970):

> A child is at a disadvantage if because of social or cultural characteristics (e.g. social class, race, ethnic origin, poverty, sex, geographical location, etc.) he comes into the school system with knowledge, skills and attitudes which impede learning and contribute to accumulative academic deficit. The disadvantage may persist throughout school life and contribute to restricting later economic and social opportunities.

Passow also defines 'deprived':

> A child is deprived if for social, political or cultural reasons, the normal facilities of the school system are available to him only in a restricted form.

That is, 'deprivation' occurs when the child is unable to attend the ordinary school system; 'disadvantage' is present when he or she goes to school but, for one social reason or another, is unable to profit properly from what it has to offer.

In this view, deprivation is seen as a complement of disadvantage, which is interpreted as essentially the consequence of difference or 'cultural deficiency'. The effects are usually analysed, at least initially, in terms of the formal school system. By inference, if they are to be mitigated, it must be through some form of compensation related to the demands of the school. This philosophy underlies much of the activity in early childhood education in the 1960s and the 1970s.

Such an analysis is couched essentially in socio-economic or, at best, institutional terms, and reflects the general trend of a policy which was seldom con-

cerned with children as individuals. Solutions to the problems of the 'disadvantaged' were seen as essentially economic, in the provision of more (and better) schools, teachers, materials and facilities generally. The model was essentially that of the economic planner. To some extent, such an approach may have been inevitable, given the climate of thinking in the 1960s and 1970s. The numbers of disadvantaged children, in terms of non-access to education alone, particularly in the Third World, have been so vast that mass planning solutions were sought — forgetting that the 'masses' were, and are, masses of children with unique and individual abilities, needs and potentials.

Even in highly industrialized societies, whether in the East or the West, with first-rate schools, well-educated and well-trained teachers, excellent material facilities and so on, there are many educationally disadvantaged children. In the Third World nations, concentrations of the high numbers of economically and socially disadvantaged tend to obscure the fact that millions of them are also psychologically, physically or culturally disadvantaged even in comparison with other children in the same societies. Such children are doubly disadvantaged. Furthermore, there is evidence that provision of better schools, teachers, equipment and so forth on a general economic-educational planning formula, may exacerbate, rather than alleviate, the comparative disadvantage of such children. Planning, unless it takes into account individual differences, may widen rather than narrow the gap dividing the 'advantaged' and the 'disadvantaged', within as well as between societies.

It is for this reason that this paper recommends the development of plans and programmes with the child as well as the society as their focus. It is not, must be emphasized, an 'either or' case. It is possible to design comprehensive programmes which aim to cater for all disadvantaged children and not only, for example, the able but poor.

It is possible to argue further that emphasis should not be placed solely upon the school system but should also be on the relationships of the child with his family and of that family with the community, and on the ways in which those relationships are reflected in the child's, the family's and the community's contact with the school. Indeed this follows directly from the seventh Principle of the Declaration of the Rights of the Child — 'the best interests of the child shall be the guiding principle of those responsible for his/her educatioin and guidance; that responsibility lies in the first place with his parents.' If there is a fundamental difference between the aims and methods of child rearing in the home and those of the school, then there is inevitable conflict and it is the child who suffers. This has not always been properly realized, particularly by the schools. If parents, almost always because of inadequate knowledge rather than neglect, are pursuing methods of child rearing which may not be in the best interests of the child, then the answer lies in the careful, planned parent education and not in the introduction of school-based programmes directed at children only. To quote a little known report by the Centre for Educational Research and Innovation, there has been

> a surprisingly belated recognition, across international differences, that there should be a fundamentally *complementary* relationship between care and education provided in the home and provided institutionally — in a wide variety of ways — by the community or state. The living link in that complementary relationship is the parents.
>
> (CERI: OECD, 1977)

A recognition of this distinction leads to a consideration of the meaning of 'difference' compared with 'disadvantage'. The concept of 'difference' is somewhat elusive and has been used, as shown by Robinson, in a variety of senses. I would argue that the term is relative and at the same time specific in that it should always refer to a definable set of variables or characteristics. We are all 'different' one from another in some sense, but the 'difference' begins to be important for educational purpose when it refers to characteristics which have salience for a particular set of objectives in a particular set of circumstances imposed by some institution or authority like a school system. In this interpretation a child is 'different' from others when he or she has definable and observable characteristics other than those assumed or required by the system. For example, a child is 'different' if he speaks Hindi or Polish when English is the required language of the school. More subtly, a child is 'different' when he or she uses a restricted language code in Bernsteins's formulation (Bernstein, 1971). This distinction is of great significance in multicultural, multilingual societies where the language (or dialect, even) of the home is not that of the school. There is accumulating evidence that the problem is not only one of vocabulary or structure, but one of the ways in which specific concepts are expressed or understood.

To go further would lead into the whole question of attitudinal theory and prejudice. It is assuredly to

be condemned when there is discrimination because of 'difference' — skin-colour or ethnic origin or religious affiliation — especially when such discrimination leads to 'deprivation' or 'disadvantage' in the senses discussed above. However, *for present purposes* we are not concerned with 'difference' in the absolute sense, but essentially with 'difference' which is demonstrably and objectively relevant to the cognitive demands of the school system.

This approach is in line with that of Cole and Bruner (1972), whose basic data are comparative and who tend to underplay the notion of 'disadvantage' and to focus on that of 'difference', arguing that in comparative cultural or sub-cultural terms, *cultural deprivation* represents a special case of *cultural difference* which arises when a person is asked to perform in a manner inconsistent with his past 'cultural experience' in the family, the social class, and the community. The school system represents one setting in which such inconsistent performance is frequently demanded and the techniques for overcoming the problem are seen as being essentially those of helping the child to learn to perform in ways which are different from or are extensions of the pattern with which he is familiar. That is, the solution is not a compensatory one: it is one of changing the methods of instruction and of learning, allied to work with parents and community in order to develop new ways of meeting the needs and problems of the data.

On the other hand Ginsberg (1972), leaning heavily on Labov's work on the linguistic and cognitive skills of ghetto children, writes of the 'myth of the deprived child' and defines' 'disadvantage' in terms of the school system as it operates. No child is disadvantaged or deprived in himself or herself; the syndrome is imposed and reinforced by the system and the remedy lies in reform of the school or the social system, not in action directed at children *per se* nor in change of their backgrounds and environments. Such an argument, while philosophically attractive, is difficult to accept at the immediate working level.

For example, to claim that 'poor' children — children born into the sub-cultures of poverty — in any country are not 'disadvantaged' is unacceptable. They lack access, not only to the goods and services available to others in the society as a whole, but also to many of the skills and much of the knowledge on which access depends. Their survival rates at birth are much lower; probabilities of serious illness both before and after parturition are much higher; when access to school is limited, such children tend to be excluded; when they are admitted, their school attendance patterns and classroom performance are demonstrably worse; their employment prospects, in terms of level of job as well as continuity within job, are abysmally less . . . and so on. They are poor in every way and are likely to remain so, as in turn are their children. Disadvantaged children, in this sense, are the products of disadvantaged parents. And in this sense, of necessity in the short run at least, the Ginsberg-Labov position is thoroughly indefensible. The problem for most countries is one of immediacy — what can be done *now* in today's society for children excluded from school, for those for whom there are no schools, and for those who are unable to profit from school even when admitted?

The argument about deficit and difference in this social context is a dangerous smoke screen, especially when it is further obfuscated by highly esoteric discussions about language, or worse, about I.Q. as measured by standardized western type of 'intelligence' tests. Labov (1970) is perfectly right — and much to be praised — for pointing out the weaknesses in the psycho-linguistic/socio-linguistic compensation thesis, but he is almost as assuredly wrong in claiming that children from poor minority sub-cultures are not linguistically disadvantaged in almost any context other than that of their own minority sub-culture. It is true from his own evidence and from that of social anthropologists, linguists, psychologists and educators working in non-Western societies, that such children, when operating within the confines of their own sub-cultures are just as efficient in the use of language in logical argument and cognitive skills generally as are their more socially and economically fortunate compatriates, *but* — and it is an important 'but' — they remain disadvantaged where it all too often matters in the social, economic and educational market places of the wider world whose advantages they rightly seek. The probability of their achieving 'the greatest possible realization of their innate potential' on the wider scale is demonstrably lower.

Whether this should be so is another issue since the question then becomes one of social choice: whether to change the sub-culture (i.e to prevent the occurrence of conditions conducive to disadvantage); or to provide links between customary community performance (in Cole's and Bruner's sense) and that expected in the wider context (i.e. to provide appropriate school opportunities); or to change the market place (i.e. to change the school or the society). These are choices for each society to make on its own terms.

It is doubtful that Cole and Bruner go far enough

in arguing the need to take the setting into account when looking at differences and designing programmes appropriate to them. Part of that setting is language. It is probably true, strictly speaking, that all languages are 'functionally equal' but this is only useful, in the practical as against the theoretical sense, if we add a phrase like 'within the context of their own cultures'. It is easy to show, as Whorf wrote long ago, that:

> Western culture has made, through language, a provisional analysis of reality and, without correctives, holds resolutely to that analysis as final. The only correctives lie in all those other tongues which, by eons of independent evolution, have arrived at different but equally logical provisional analyses.
>
> (Whorf, 1956)

Bridgman's brilliant article in *Daedalus* in 1958 makes much the same statement in different words. He writes:

> It begins to look as though formal logic, as we know it, is an attribute of the group of Indo-European languages with certain grammatical features.
>
> (Bridgman, 1958)

The problem is that it is precisely the Western reality described by Whorf and the Western logic analysed by Bridgman which underlie most modern science and technology and which therefore dominate most economic systems and hence school systems, founded as they are on European (West and East alike) or United States models. Even within the industrialized societies there is a dominant mode — that of the middle class, and 'poor' children are disadvantaged in relation to it. To use a different metaphor, the rules of the school and societal games are usually couched in specific language terms, and unless children learn the rules they are unable to play or at best play indifferently well — let alone win. Cole and Bruner write that:

> The teacher should stop labouring under the impression that he must create new intellectual structures. He should start concentrating on how to get the child to transfer skills he already possesses to the task in hand.
>
> (Cole and Bruner, 1972)

The difficulty is that in some cultural contexts, *relevant* transferable skills may not exist or, more commonly, linguistic structures may not be appropriate, especially when school instruction is not in the mother-tongue or mother-dialect. For example, among the Melpa people of the Western Highlands of Papua New Guinea, complex linguistic hierarchies of classification do not exist (Kelly and Philp, 1975). The languages are *functionally* appropriate entirely to the society and the culture, but are not functionally appropriate to the learning situation of the school. 'Transferring' in the Cole and Bruner sense is extraordinarily difficult. The reverse is true of English which is opposite to the imposed school curriculum but has major limitations in the day-to-day context of Western Highlands' culture. It is no answer to say 'change the school' when the people themselves are ardently seeking the rewards which (rightly or wrongly) they perceive the existing school culture is bringing. If there is some conflict between language and concepts to be learned, then the curriculum and teaching methods must be carefully designed to overcome any problems which arise.

This is far from denying the right of every child to be taught in his or her own language; it is rather to stress the view that great care must be taken to ensure that concepts and ideas are properly introduced when they are not endogenous to the particular culture.

At the project level, this again implies a relativist approach. A target group is one whose members are less likely to attain or achieve their potential than the majority within the same society. Such groups are difficult to define precisely except in terms of any given project: the definition becomes operational.

Inevitably such a relativist position can lead to charges of inconsistency or even inequity if comparisons are made across or between countries rather than within them. On any absolute scale, this impeachment is unanswerable if one accepts the view that all children everywhere are entitled to fundamental human rights and to equality of opportunity in all spheres of life. To this pragmatic answer may be given that within any one society it is the relative position which becomes important in the short term because of limited resources and because all concomittants of 'disadvantage' must be opposed wherever and whenever they are found. In the long term — which should be as limited as possible — the world objective must be to prevent or to minimize all disadvantage everywhere. Every child in every country should and eventually must be equally advantaged, but this will take time for social, cultural as well as economic reasons. Immediate pro-

grammes and projects will accordingly be directed to the alleviation of 'disadvantage' within particular systems. This does not, obviously enough, exclude regional and international policies and plans.

There remains the problem of the possible stigma which may be attached by defining any particular group as being 'disadvantaged', leading, as it may, to charges of 'cultural intolerance'. That is, there is a question of value judgements implicit in the designation of any one child or group of children as being 'disadvantaged'. The answers can only be in relative terms within any one society or in absolute terms when measured against the 'Rights of the Child'. If those rights are infringed or impaired for any one child, then that child, by definition, is 'disadvantaged; and the stigma attaches to the international community or to the local society and not to the child.

In theory at least, this definition has been to some extent accepted and many projects have been concerned with educational programmes directed at the children and to a growing extent the parents and communities. The intent has been essentially to increase the probability of children's reaching their innate potential, however this has been defined. That all children in many countries are *disadvantaged* is obvious; but that many of them are also, in definable ways, *different* from the general run of children within their own societies is also amply demonstrated. For present purposes it is irrelevant whether this 'disadvantage' and 'difference' results from 'cultural deprivation' or some kind of deficit in their family backgrounds. The children are demonstrably disadvantaged and it is with this fact that we as educators should be concerned.

The 'different' child *may* as a consequence be 'disadvantaged' according to Passow's definition but the two terms are not identical. Furthermore, there is not necessarily the same pejorative sense about 'different' as there often is about 'disadvantaged'.

Similarly, 'deficit' carries some negative connotation in that it implies a lack of some essential, highly valued or important characteristic, but this concept, too, must be looked at in relevative terms in the present context. The child is educationally 'deficient' when there is a lack or inadequacy in some characteristic relevant to the demands of the school situation. In this usage the child who is 'different' or, for other reasons 'deficient', in relation to the school and its demands may be 'disadvantaged' as a direct consequence.

This analysis is not merely semantic play, for each concept has quite specific implications for the educational programme related to it.

This is not the place to discuss arguments such as those of Keddie and others (1973) on the 'myth of deprivation' (with which I have much sympathy). The point is that for an international organization or for a school system operating within a particular society, 'disadvantage' is a real issue. There are many children who for a variety of social reasons are hindered or prevented from attaining their full potential, whether intellectual, social or physical, within their own countries. The long term solutions may well lie in changing the society and the school, but nations and their school systems are faced with finding short — or medium-term solutions for children who are at school today or who are likely to be at school in the very near future. What then can be done to eliminate or minimize the negative effects of 'disadvantage',* 'deficiency', 'difference' or 'deprivation'?

Theoretically, there are at least three fundamental strategies, each with variants:

1. to change the child,
2. to change the school, or
3. to change the society.

## 1 To change the child

This has a number of possible variants. Most common is the assertion that we should provide the child with 'missing' or 'important' knowledge, skills or attitudes to enable him or her to cope successfully with the demands of school *as it is*. This solution assumes 'disadvantage' and 'deficiency' *vis a vis* the school. This is the traditional 'compensation' solution. It implies intervention. It also assumes that the schools, including their curricula and teaching methods, are fundamentally appropriate to the needs and potential of the vast majority of children and to the needs and demands of the society. The 'weakness' is in the child and special programmes should be provided to ensure that he or she is provided with the necessary knowledge, skills and attitudes to cope effectively with the school system. Most, but not all, programmes of this kind directed specifically at children have been at the Preschool level. They have accepted Benjamin Bloom's hypothesis that:

* *Note:* For ease and economy of writing in most of the remainder of this paper "disadvantaged" has been used as a generic term to include "different", "deficient", "deprived", when that "difference", "deficiency", or "deprivation" has, as a direct consequence, the effect of lowering the probability of children realizing their potential.

> . . . change in many human characteristics becomes more and more difficult as the characteristics become more fully developed. Although there may be some change in a particular characteristic at almost any point in the individual's history, the amount of change possible is a declining function as a characteristic becomes increasingly stabilized.
>
> (Bloom, 1964)

Bloom may well be right but on the evidence most, if not all, compensatory programmes have been less than successful when they have been designed specifically to prepare the child, as such, for the academic aspects of school as it is. Young children are a good deal more than prospective pupils and schools are concerned, either explicitly or implicitly, with a great deal more than cognitive performance.

Less well known are the projects which, while still concentrating on the child, as distinct from the child-in-a-family or the child-in-the-community, have endeavoured to change 'the whole child' — physically and emotionally as well as intellectually. Such solutions imply socialization apart from the family or the community, i.e. they are institutional in that children are taken out of their natural setting and reared in a thoroughly controlled environment. Programmes of this kind are now rare, but were once much in vogue. They too, in general terms, may be said to have failed to meet their objectives. Children need families if they are to develop as whole people.

More recent trends have been to develop projects which focus on the child within the family or community setting. The target remains in the child: little is deliberately attempted to change the family or the community in themselves, except in so far as treatment of the child is concerned. Programmes of this character have been most successful for children whose disadvantage is physical, mental or emotional handicap. They have also met with some limited success in projects like 'Home Start' or 'Home Base' where the objectives are similar to those discussed above: to prepare the child for the school-as-it-is. They have been less successful when applied more generally.

In general the evidence would appear to support the view that programmes, which attempt to change children in themselves, without at the same time changing the school, the family and the community are doomed to failure.

## 2 To change the school

The proposition is that by making alterations or adjustments to the school and its offerings, the disadvantaged child will be better able to profit from its offerings. There are several variants of this solution varying from the ameliorative or palliative to total restructuring. However, we may briefly discuss three common possibilities.

The school may be provided with 'additional' or 'different' equipment and materials assumed to be compensatory. In effect, the school becomes a kind of intellectual Father Christmas. This strategy stems obviously enough from the basic assumption that 'disadvantage' is in its essence a function of poverty. The opening paragraph of the definitive account of 'Head Start' makes this plain:

> Head Start emerged as a social action programme at a time in history when social and political forces, as well as intellectual traditions in the social sciences, had come to focus on the problem of poverty. The story of Head Start's development is an intricate one because all of these threads run through it: the social and political struggles of the Civil Rights era and the War on the Poverty, revival of scientific interest in the realm of environment and human development, and the design of education — and intervention efforts for children of the disadvantaged. (p. 3)
>
> (Zigler and Valentine, 1979).

The prescription was apparent: both 'disadvantaged' and 'different' imply a lack. Poverty implies inability to obtain or buy materials — books as well as food, learning as well as nutrition. The school by providing both would complement and hence compensate. The assumption that the disadvantage lay essentially in material resources is reasonable *only* if seen in the context of poverty and its prevention or amelioration. The fundamental weakness of the somewhat 'naive optimism' of the view that education was, or could be, an antidote to poverty can readily be argued, but the proposition gained considerable credibility in the context of President Johnson's 'War against Want' and his stirring apothegm 'Poverty has many roots, but its tap root is ignorance' (Johnson, 1965). If the gross oversimplification of this position is accepted for the moment, it is certainly easy to show that in highly industrialized societies, like those of the United States, Europe or Australia, education can and often does

provide one means of escape from the poverty for some children. In the developing world, however, the argument lacks even this validity. The causes of poverty and their effects are wider and deeper — and so must be the remedies but 'Head Start' and its derivative have had a major influence throughout the world on programmes for the disadvantaged.

Furthermore, not all 'disadvantage', as defined, is a consequence of poverty: it may be a product of social class, ethnic affiliation, physical or mental handicap, language, child rearing practices, cultural values and beliefs, community attitudes, isolation — the list could be extended almost indefinitely. Many of these variables are often associated with poverty, some causally, some more or less incidentally, and some have no relationship whatsoever. That is, to equate poverty and disadvantage may be, and often is, to fail to identify a number of target groups of relevance and significance. To put the matter epigrammatically: most children of poverty are disadvantaged, but not all disadvantaged children are poor. The Father Christmas model, despite its high principles has not worked particularly well.

The second means of 'changing the school' has placed emphasis on curriculum and teaching methods for *individual children*. There is no attempt to identify *groups* of 'disadvantaged' youngsters. Instead, each child is treated as an individual: specific 'disadvantage' is diagnosed and identified, and appropriate 'remedial' techniques are devised. The objective in this philosophy is to teach and develop individual knowledge, skills and attitudes which will enable the 'disadvantaged' child, in the broad sense of the word, to 'fit into the normal classroom'. This approach is obviously enough related to notions about changing the child, but it goes somewhat further in its assumption that the school must accommodate to the needs and potential of the child as an individual rather than the other way round. Programmes based on this philosophy have characteristically, although not exclusively, been developed for the child disadvantaged by physical, mental or emotional handicap. When the programmes have also involved parents as active participants such efforts have often been highly successful. They are expensive and require well-trained, sensitive teachers.

More common, superficially more attractive but potentially more dangerous, is a strategy aimed at providing alternative curricula and teaching methods for groups of children, identified and classified as 'disadvantaged' because of their membership of those groups. It is in terms of such procedures that the distinction among the terms 'difference', 'deficiency' and 'deprivation' becomes highly significant. It is essentially against such a distinction, in fact, that Labov (1970) in one context and Paulo Freire (1972) in another, are rightly most polemic. The danger is plainly that if children who are 'different' in terms of language, ethnic origin, location or whatever are defined as 'disadvantaged' or 'deficient' because of that difference and are in consequence presented with school experiences which reinforce and exaggerate the effects of that disadvantage, then the result is to reduce rather than enhance potential. The flagrant example is 'apartheid' schooling where some groups of black children are exposed to a diluted, modified, broken down curriculum because they are 'not yet at a proper stage of development' to be able to cope with the standard system. As a result, difference and hence disadvantage become institutionalized. Cases of this kind are easy to identify and to be condemned. Less apparent are the instances in which curriculum and method are 'specially designed to meet the specific needs' of particular groups — migrants, itinerants, linguistic minorities, the very poor — and the 'specific provision' all too often adds to the disadvantage.

And yet, given the existence of groups of children who are demonstrably disadvantaged in educational terms, and given also a strategy which is school-related, specific curriculum and methods must be designed and taught, the fundamental difference must be one of objectives: both general and specific. It is possible to argue that achievement of human potential can be enhanced in many ways and that an education system or a school should be concerned with determining and developing means of ensuring that all children have a reasonable probability of attaining their own intrinsic capacity. This implies a highly flexible system whose goals and means are carefully defined in terms of *all* children.

And herein lies the rub. And strategy which focuses on either the child or the school as such as a means of preventing diminishing or compensating for disadvantage inevitably accepts the proposition that fundamentally the school system is an appropriate one for the needs and demands of the society as a whole. This view is implicit in Passow's definitions of 'disadvantage' and 'deprivation' which were quoted above. School systems are thought to be good: the problem is to ensure that all children have equal probability of access to them and once there, they have a probability of learning from them that is consistent with innate potential. There can be improvement within the system — in greater access and teaching skills; in curriculum and methods; in

physical and material facilities, *but* the system itself is assumed to be fundamentally sound.

Moreover, such a view is almost inevitable for any external agency, whether it be the World Bank, Unesco, bilateral aid agencies or foundations, which accept the concept of national sovereignty. Yet few educators would subscribe to the thesis that all educational systems are fundamentally good.

## 3 To change the society

The third strategy of changing the society may also take several forms.

At one level, the simplest, it may consist of extending the concepts of disadvantage, difference, deprivation and deficiency from the individual to the family and the community. 'Disadvantaged children come in the main from disadvantaged families living in disadvantaged communities.' So runs the argument. And just as the assumption is made that the schools in general meet the needs of the society as a whole, and 'disadvantaged' children should be given opportunities to profit equitably from them, so it is presumed that, in general, society as a whole meets the needs of its members and that 'disadvantaged' groups in the generic sense, should be given the proper opportunities. This is all that is necessary to ensure equality for the realization of potential.

Arguments along these lines lead to programme within families and communities designed to produce changes in behaviour which will increase the probability that children will be better able to profit from the schools. This is to impose something akin to a compensatory model on communities and families. It is taken for granted that there is some kind of core or modal set of behaviours characteristic of the society, and that groups which do not display these behaviours are in some way 'disadvantaged'.

The second model for changing the society as a target for intervention programmes, is more closely related to the living patterns and values of the 'disadvantaged' groups themselves. In this formulation efforts are made to identify the relevant characteristics of the groups, including the social aspirations and skills of its members and then to develop educational programmes, both formal and informal, consonant with these aspirations and abilities.

There are two variants of this model — one positive and the other negative. When decisions about the nature of the educational programme are made by the members of the community itself; when they are in Unesco terms, 'endogenously determined', then the consequences may be said to be positive. External aid, whether national or international, is used to support the wishes and plans of the family or of the community. The result are negative when the investigation and the consequent decisions are made by some external body and imposed on a community as being 'best for the people at the present stage of their development'. Such solutions or proposals are essentially of an apartheid kind.

Logically, a third possible 'change the society' strategy for prevention or alleviation of disadvantage is drastic social change. Every major revolution in modern times — French, Russian, Chinese — and most successful independence movements have been accompanied with greater or lesser success by a thorough restructuring of the education system as one means of providing greater, more equal opportunity for all children.

It follows that the major concern must be, and can only be, with the *improvement of the quality of educational services for disadvantaged children*. This does not mean *only* improvement of school systems: it *also* forcibly implies programme for and within families and communities in non-formal situations.

It also implies development of programme with curriculum, methods and techniques specifically designed to meet the needs of the particular children, whatever the nature of their disadvantage. This throws a great deal of responsibility on the professional knowledge and skills of teachers. It demands a detailed analysis of the unique situation and the provision of resources to meet each situation — difficult and expensive though this may be. If democracy means anything, it means equality of opportunity in both the senses in which I have used the phrase — equality of opportunity of access to education facilities and equality of opportunity to take maximum benefit from those facilities.

In more specific terms, what all this means for the classroom teacher depends on a series of factors:

- the general strategy, i.e. whether the target is to be the child, the school or the society
- the nature of the disadvantage
- the teaching-learning model adopted
- the resources and facilities available, both human and material — including the education, training and skills of teachers themselves.

Enough has been said about the first two fo these — the strategy and the differential nature of disadvantage — but something should be added on the more specific issues of instructional models and resources.

For the sake of ease of presentation and discussion, I shall try to speak in terms of formal school situations, but the principles apply with equal strength to non-formal education and to programmes focused on individual children or on communities. That is, although what I have to say now will concentrate fairly specifically on classrooms and on teachers and children within those classrooms, I would insist that on all the evidence available to us a purely classroom-based programme for disadvantaged children is, at best, ineffective in meeting even its own objectives, let alone those of the children and their families. Home influences far outweigh those of the school. It follows that the help, cooperation and understanding of parents are vital, if any programme for disadvantaged children is to succeed at any level. Apart from the right of parents to know what is happening to their children, they are more likely to support the school if they are kept carefully aware of its activities, aims and methods. In addition, there should be consistency in teaching-learning methods and this may well mean working actively with parents as part of the curriculum itself.

That said — what types of teaching-learning models are available and what are their implications? Essentially there are two major groups: those based on psychological theories about the nature of child development and the learning process and those based on educational theory and practice. Each has its adherents and disciples and there is no hard research evidence to suggest that one is any better or worse than another. What we do not know is that no model is effective in meeting objectives unless the teachers concerned are clearly aware of what they are doing. Many of the so-called 'failures' of 'Head Start', for example, were really failures of the schools to ensure that the teachers were properly educated and trained not only in the methods and techniques appropriate to the specific curriculum, but also in the basic ideas behind that curriculumm. To take an important if obvious example, a number of classroom programmes, supposedly based on Piagetian theory, have been totally ineffective because the teachers have had little or no idea of the basic principles and have done no more than use the materials and equipment in ways learned in relation to quite other and different principles. This is not to criticize the teachers: it is to blame those responsible for introducing the new programmes without adequate thought about the need for in-service teacher education.

**(a)** Programmes derived from 'psychological' theory are of two basic types:

**(i)** Those based on theories about child development, either in cognitive terms (e.g. programmes derived from the work of scholars like Piaget or Bruner), or in socio-emotional terms (e.g. programmes derived from the work of the psychoanalysts), or in eclectic terms (e.g. those which purpose to enhance all-round development). In general terms, such theories have a genetic base, in that they assume that there is an inbuilt pattern or sequence of development which may be facilitated or impeded by environmental factors, including the school.

The great majority of developmental programmes for socially or economically disadvantaged children have been cognitively based, partly because schools are more concerned with cognitive processes than with other aspects of human development but also because of the fashion for Piaget and his followers or derivatives which dominates current thinking and writing on child development as related to education.

**(ii)** Programmes based on learning theory of one type or another. Broadly speaking these may be categorized as 'environmental' type programmes, in that they assume that the educator's task is to set up carefully planned situations in which the child, through appropriate reinforcement, is able to learn the knowledge, skills and attitudes required by the curriculum. Such programmes are frequently designated 'behaviourist', although many modern theorists such as those concerned with direct instruction would reject the term.

It may be argued that behaviourist programmes, by their nature, accept the 'compensation' hypothesis for education of the disadvantaged. This is not necessarily true, but it would seem clear that those who have relied on compensatory education for disadvantaged children have probably had a greater measure of success with such programmes than with those based on cognitive theory.

**(b)** Programmes derived from educational theory and experience may also be conveniently be divided into two groups:

**(i)** Those which are based on the view that

there are readily definable sets of knowledge, skills and attitudes which all children must acquire to some reasonable level of competence. The designers of programmes of this type therefore develop curricula and methods for the education of disadvantaged children to ensure that they attain the appropriate levels of such competence. These programmes, logically enough are usually termed 'competency based'.

**(ii)** Those based on the traditional early childhood education theories and practices of Froebel, Montessori, Pestalozzi and others. These are related to the 'development' theories mentioned above, but there is an important difference in that they are founded on notions about the 'nature' of the child and the aims of education as distinct from ideas and theories about the way in which children develop as a consequence of the interplay of genetic and environmental factors.

It must be emphasized that very few, if any, programmes are 'pure', in the sense of being based entirely on one theoretical approach. Most are in some measure eclectic, some almost completely so, but it must also be emphasized that the implications for classroom practice are quite different for each approach. The methods and techniques appropriate for a compensatory programme based on language competency are quite different from those produced for a developmental programme whose objectives are also related to language skills. In both cases, however, teachers must be able to identify clearly the nature of the disadvantage and develop a programme which will alleviate or eliminate its effects. The difference comes in the curriculum and methods. It is apparent that special programme for disadvantaged children demand a high degree of professional dedication, knowledge and skill, including a readiness to learn new ways of teaching appropriate to the nature of the disadvantage and the educational model chosen. From the available evidence it may reasonably be asserted that 'the precise form and content of the curriculum is of lesser significance than the child-teacher relationships' (Bernard van Leer Foundation, 1984) provided the form and content are carefully developed in a consistent manner based on a well-formulated and well-understood set of basic principles. At the early childhood and primary levels at least, there are few, if any, data to suggest that any one theory is better than any other — provided it is consistently developed and used.

The fourth set of factors to be taken into account within classrooms relates to the nature and availability of resources. Little need be said about material resources other than to emphasize the obvious; no curriculum should imply the use of equipment which is not available or whose use is beyond the skill of the teacher or the understanding of the child. This seems obvious, but most classroom teachers are only too aware of the amount of equipment, including textbooks, which has been sent to them because it 'looks good' or 'worked well' in the United States or Britain (or somewhere else with a different set of problems and a different curriculum) and is quite unsuitable — and often unusable — in the new context

Of more immediate concern is the overwhelming need to develop programmes which take into careful account the available human resources — usually teachers — and the knowledge and skill of those teachers. It is often counter-productive and pointless to introduce programmes based on unfamiliar principles which involve new curricula, methods and techniques without ensuring that the teachers are properly prepared. All too often there has been an assumption, he or she is thoroughly competent to teach anything in any required way. It is an assumption we would totally reject in other professions. Before a doctor, for example, begins to use an entirely new method of surgery we rightly expect a rigorous period of re-education, but we are prone to introduce new methods of intellectual surgery without making similar provisions. Teachers are capable of radical change in their methods and techniques of the kind essential for work with disadvantaged children, but they must be given the opportunity to learn the new methods in systematic ways. It is false economy to pretend otherwise.

To summarize, I have tried to suggest that children are important in themselves and that programmes for disadvantaged children, particularly educational programmes, should be developed for them and not specifically for institutions. I have argued that education is a fundamental strategy for the elimination and alleviation of disadvantage, but that the particular methods to be used will depend on the nature of the particular society — there are no universal panacea. Teachers have a critical role to play and must receive the education and training appropriate to each specific programme. I have also urged the view that school-based programmes in themselves are inadequate: parents must be actively and meaningfully involved. ■

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# Reading Acquisition in Singapore

*Ng Seok Moi*

## Background

One of Singapore's problems with reading acquisition programmes stems from the fact that although most of our children come from non-English speaking homes, their parents' choice of the medium of instruction is English. This means that English is taught right from the first day the child enters school. Most of the other countries where English is taught and is not the mother tongue, use the mother tongue as a medium of instruction for several years before the introduction of English. Neither are Singaporean children totally immersed in English at school because they also spend part of their school time learning a non-English language, namely Chinese, Malay or Tamil. Investigation into problems connected with the teaching of English and reading is therefore very important for Singapore, especially since one of our education system's streaming procedures is instituted very early, at the end of the third year of schooling at Primary 3.

The Reading Skills Project was set up initially to lay the groundwork for such an investigation by obtaining a description of the strengths and weaknesses of our lower primary children's reading skills. In response to a fresh official request to present preliminary recommendations on teaching strategies by mid-1984, the scope of the study was enlarged. Besides collecting data on Primary 1–3 children's reading, it has included a search for reading instruction approaches appropriate for the Singapore classroom, and a systematic observation of reading class activities that included interviews of teachers on reading class activities that included interviews of teachers on reading instruction issues. This paper rationalizes its recommendations for an instructional approach by discussing, on one hand, research findings on reading instruction needs, and on the other, appropriateness of the recommended instructional approach.

As this paper is written at the mid-point of the project, it can only offer preliminary recommendations that will need to be modified and refined by further research and discussion before implementation.

## The Children: Research Design and Procedures

A cohort-sequential study was decided on as the most suitable design for collecting a description of the children's reading skills.

Table 1 shows that one cohort will be followed right through from Primary 1 to Primary 2 and then Primary 3. Cohorts 2 and 3 will only be followed for two years. Other cohorts can be obtained (i.e. one Primary 3 in 1983 and another Primary 1 in 1985) so that in any one year, data will in effect be collected at all 3 primary levels. Progress of these children will be monitored twice yearly.

TABLE 1 — TIME FRAME FOR THE RESEARCH PROJECT

| Year | Cohort 1 | Cohort 2 | Cohort 3 | Other Cohorts |
|---|---|---|---|---|
| 1983 | Primary 1 | Primary 2 | | Primary 3 |
| 1984 | Primary 2 | Primary 3 | Primary 1 | |
| 1985 | Primary 3 | | Primary 2 | Primary 1 |

The following instruments were used in the study; two running records (Clay, 1979a), the Burt Word Reading Test (Gilmore, Croft & Reid, 1981), the Neale Analysis of Reading Ability (Neale, 1969), the Diagnostic Decoding Inventory (Young, 1979), the Record of Oral Language (Clay, Gill, Glynn, McNaughton & Salmon, 1976) and Writing Vocabulary (Clay, 1979b).

* This paper presents part of the findings of a research study funded by the Institute of Education, Singapore. The other members of the team are Olivia Soh, Maureen Khoo, Gail Hanamoto-Rahman and Diana Lee Lew. The team wishes to thank others from the Institute of Education, especially Ng Chwee Poh and Claudia Sullivan for their help in the study.

The sampling procedure attempted to obtain as large a group of children as possible that would be representative of the general Singapore population. The first step towards the selection of the final sample was to obtain a stratified random sampling of 24 schools chosen on the basis of their English language results in the Primary School Leaving Examinations. A total of 3,765 children from Primary 1,2 and 3 of these 24 schools were tested on the Burt Word Reading Test. On the basis of scores obtained on this test, the children were then allotted to 12 different groups of reading progress, 4 at each of the primary class levels (i.e. High, High Average, Low Average, Low). Random sampling proceeded from within these various groupings and finally a total of 312 children were selected.

The sampling procedure and the variety of measuring instruments chosen enabled us to test as many component skills and as wide a range of reading abilities as possible so that we could observe reading difficulties in our poor readers and strategies employed by our good readers.

## Results and Discussion

This paper presents the cross-sectional data because the longitudinal aspects of the study have not been completed. An examination of the data collected at the three test stages reveals similar trends, and provides strong confirmation of the conclusions presented in this paper. For discussion purposes, data from Stage 3 will be presented.

### *General Findings*

Table 2 reveals a range of scores on all the tests administered to the children at the 3 primary class levels. This range of scores which reflects heterogeneity of progress levels is also found within each primary class level.

Although the research team did not systematically test pre-reading skills, it observed that the poor readers, especially from Primary 1, lacked these pre-reading skills or concepts about print (Clay, 1976b). These poor readers were also observed to lack skills necessary for instruction in word-attack skills, including those using letter-sound relationships, word parts or structural analysis, grammatical structure or syntax clues and contextual meaning.

### *Data from the Running Records*

One quarter of the children in Primary 1, 2 and 3 are reading their classroom texts at the frustration level; i.e., with less than 90% accuracy. These are passages the teacher has recently taught the children to read in class. This is not a desirable situation because Cooper in a classic 1952 study of children in grades 2 through 6, found that the easier the reader was for the child, the more progress the child made during the year (see Harris, 1976). The generalization holds for both sexes and for ability levels ranging from above to below average children. Various other researchers agree that learning is most efficient on instructional material that is easy enough to allow pupils not only to develop fluency and to enjoy reading but also to concentrate on new words and ideas (Harris, 1979). Therefore it is important for the teacher to procure a set of books that is well graded and suitable for the intended population (see Ng, 1984).

Further support for the use of easy instructional material comes from the analysis of children's self-correction behaviour while reading classroom texts. The results of this study support findings from other error-analysis studies (see Ng, 1979) that children self-correct more on easier texts than on more difficult texts. This is easily evident if it is remembered that the unfamiliar texts are read with lower accuracy rates than the familiar texts. In observational studies of children's behaviour, it was found that children were able on their own to detect

TABLE 2 — MEANS FOR SCORES OF CHILDREN ON BATTERY OF TESTS

| Level | No. of Children | Burt Word | Diagnostic Decoding Inventory | Record of Oral Language | Writing Vocabulary | Familiar Texts | Unfamiliar Texts | Neale: Reading Accuracy | Neale: Reading Comprehension |
|---|---|---|---|---|---|---|---|---|---|
| Pr. 1 | 208 | 10.8 | 19.0 | 7.0 | 27.5 | 88.2 | 67.0 | 5.9 | 1.9 |
| Pr. 2 | 207 | 28.7 | 51.5 | 13.8 | 45.5 | 92.6 | 85.9 | 18.9 | 5.6 |
| Pr. 3 | 207 | 37.6 | 72.0 | 15.3 | 64.0 | 93.7 | 90.7 | 27.4 | 8.3 |
| | | *** | *** | *** | *** | | | *** | *** |

*** $p < 0.001$

and correct their errors. As a child corrects an error, she/he may improve his understanding of the cue systems (e.g. graphic and contextual cues) available to her/him and the inter-relationships between these systems in reading processes. The ability to detect errors and learn from self-correction is a valuable asset to the child because of its potential as an important self-teaching strategy.

### *Data from the Reading-Related Tests*

Two important finding from the reading-related tests merit mention.

The skills measured in the Diagnostic Decoding Inventory, the Record of Oral Language and Writing Vocabulary have been found to relate highly to reading progress. This relationship is also found in the present study. The better readers tend to score better on these reading-related tests. Differences among the 4 progress groups at each of the primary class level are statistically significant at the $p < 0.001$ level. It is not unreasonable to assume that if effort is made to improve these skills, reading performance may also improve. The educational implications are further explored in sections below.

The Singaporean children's scores on these tests are understandably below the norms of children from English-speaking countries. A more interesting finding is that Singaporean children's scores on the measure for Writing Vocabulary compare more favourably with overseas norms than their scores for the Record of Oral Language, the Burt Word test or the Neale test. Any reading programme embarked upon can use this strength of their writing skill to support their efforts in learning to read.

### *The Neale Analysis of Reading Ability (Neale Test)*

The scores of the children on the Neale test show that their average comprehension scores are lower than that for reading accuracy. This provides evidence for the claim that the ability to read accurately does not guarantee comprehension of what is read.

While recognizing the importance of the role of decoding in reading accuracy, one should ensure that word identification strategies be learnt in meaningful contexts because previous studies have also described our children's reading as 'barking at print', (Heaton, 1979; Ng, 1980). Logically then, the strategy to adopt is one that teaches word identification skills within a meaningful context, so that our children will have in their listening and speaking vocabularies, words they will encounter in their reading.

This logical conclusion is supported by inference from further analyses of the data.

### *Correlation and Multiple Regression Analyses*

A correlation matrix was worked out for the different variables; reading accuracy on Neale test, reading comprehension on Neale test, the Diagnostic Decoding inventory (DDI), the Record of Oral Language (ROL) and Writing Vocabulary (WVOC). The analysis indicates that the last three tests, the reading-related tests, are significantly intercorrelated ($p < 0.001$)

Examination of the correlational data shows that if reading accuracy is correlated with the three other variables, DDI (an indication of decoding ability) appears to have a higher correlation then ROL (an indication of control of oral language) or Writing Vocabulary. On the other hand, if reading comprehension is correlated with these three variables, then ROL has the higher correlation. While the data indicates the importance of decoding to reading accuracy, it also suggests that a command of the syntax is just as important for comprehension of what is read.

Simple correlational analyses do not account for the contribution of the combination of variables. Therefore, the data were subjected to a stepwise multiple regression analysis to determine at each step the contribution of one, two or three variables in explaining the variation in reading accuracy and reading comprehension. These analyses were applied to the total group at the three primary class levels and again separately at each of the progress levels. The general pattern emerges that when the three variables were included, 86% of the total variation in reading accuracy and 74% of the total variation in reading comprehension were accounted for by the contribution of the three variables. The additional contribution of each of the variables is significant at the $p < 0.15$ level.

The data support a view that all these skills (decoding, oral language, writing) are interdependent and should not be neglected if reading success is to be ensured. It does not support the exclusive emphasis of one skill at the expense of another at any of the Primary 1, 2, or 3 levels.

The linguistic analysis of the children's oral reading errors also shows a relationship between good readers and the ability to use decoding and oral language skills in attacking difficult words encountered in both familiar and unfamiliar texts. Therefore, our

reading programme should include teaching strategies aimed at helping children use these reading-related skills in an integrated manner. This emphasis on an integrated system of reading behaviour is essential because it has been found that good readers are distinguished from poor readers in the way they build the subskills into one single process so that the components of the process become mutually facilitating instead of a number of unintegrated, independent subskills (Guthrie, 1973). Teaching strategies therefore should focus on getting the child to use these subskills (e.g. decoding skills and oral language) in an integrated manner to cope with reading tasks in the classroom.

## Reading Instructional Activities

In addition to collecting data by testing children, a small classroom observation study was carried out in the 72 classes that these children were taught in. This study used an instrument (adapted from Duffy & Anderson, 1982) which measured the time given to the different instructional activities within a reading period and was supplemented by a teacher questionnaire on various aspects of reading instruction.

The evidence from this study shows that reading instruction is markedly similar to that found in an earlier exploratory study (Ng, 1980). The observational study and responses to the teacher questionnaire show that the most favoured techniques are the use of oral drill with flashcards and the chorus reading of basic reading texts. The skill most frequently promoted is isolated word recognition. This restricted range of instructional techniques seems inadequate for coping with the wide range in reading levels found at the three primary class levels, or for reducing weaknesses presently found in our children's reading skills.

## Educational Implications

### *Basic Principles*

The Language Experience Approach to Reading (LEAR) is being recommended by the research team as either an instructional alternative or a supplement to the programmes being used currently in Singapore schools. This approach provides a pre-reading programme, a foundation for word-attack skills, a gradual introduction of new English vocabulary as well as a whole class approach that also makes provisions for differences in ability. This approach is recommended not only because it is judged to facilitate reading acquisition but also because it may foster more positive attitudes towards learning and reading generally.

LEAR embodies sound education principles basic to learning and teaching which are not adequately provided for in the present educational system.

**(a)** Motivation is of utmost importance in facilitating learning and in fostering positive attitudes towards future learning and reading. To keep motivation high therefore, learning tasks should be appropriate for the pupil's age and interest. More importantly, children should not be instructed on texts that are too difficult for them.

**(b)** The approach should be meaning based, emphasizing the important goal of understanding rather than imitating the language. Special care should be taken to ensure that Singaporean children understand what they read because for many of them, English is a foreign language.

**(c)** To sustain interest, many more varied instructional aids and activities should be used.

**(d)** Reinforcement to facilitate learning should be provided through practice with integrated cross-curricular subject matter (e.g. English, Science, Mathematics) or by consistently integrating the practice of specific skills (e.g. reading, writing, listening and speaking activities) with the general subject area of English language teaching. Judgement has to be made on the units to be taught this way because not every learning unit lends itself easily to the integrated approach. The principle underlying this approach is one of reinforcement and practice, not reliance on monotonous repetition.

**(e)** Any good programme should include the monitoring of the progress of the child, obtaining continuous diagnostic information about the child's efforts in the various activities and the use of this information to determine follow-up lessons. Early detection of learning difficulties can prevent over-practice of incorrect responses, while corrective teaching can help a child step on to the path of learning again.

Although LEAR is currently being tried out in a few classrooms in Singapore, it is anticipated that the change from order and drill to a more flexible programme may be too confusing a change for some teachers, especially for those who are not native speakers of English themselves. It may be possible as an interim measure for such teachers to use a similar approach that offers more structure but which embodies the essential elements of LEAR.

## Recommendations

If the principles outlined in the above section are accepted as being important to the teaching and learning of languages, then some changes have to be made to certain aspects of our education system.

(a) The principle of integration demands that reading instruction time be integrated with language learning time. Therefore time-tables would have to be blocked for at least the English subjects.

(b) It would be necessary to review the present structural syllabus and devise a more functional one to help the teachers plan activities and experiences which would first introduce the English patterns that are most relevant and useful to the children.

(c) Careful attention should be paid to the readability levels of the children's present basic readers so that resequencing, addition of missing levels and a more gradual introduction of new vocabulary can be considered for future revision of the materials.

(d) Some thought should be given to devising methods of shifting the control of the children's textbooks from the parents to the teachers who, with training, will be able to match materials to abilities. Instead of buying individual sets of textbooks for their own children, the parents could contribute to a book fund set up for the purpose of buying books for school use. Teachers then would be freer to choose the appropriate textbooks from a central book supply according to their knowledge of each child's abilities.

(e) Many Singapore teachers need a retraining course in the newer approaches to the teaching of reading. Two levels of training would be needed for different types of reading personnel required: a basic and general course for English language teachers and a more advanced and specialized course for reading advisers.

## Concluding Comments

The success of a programme does not end with the identification of problem areas and the suggestion of solutions. The dissemination phase is just as important.

> If the dissemination phase of a curriculum development project is to be successful, it needs to be organized methodically on a large scale. It cannot be left to chance, laissez faire or an expectation that teachers will eagerly research all new materials . . . Probably at least as many resources need to be devoted to this phase as to the development of the project phase, in terms of time, money and personnel.
>
> (Whitehead, 1980 Pg. 58)

The tasks of re-orgnizing the Singapore educational system in the lower primary schools and retraining reading teachers are massive ones. However, the prospect of facilitating early reading acquisition makes it a worthwhile undertaking because early reading acquisition is substantially correlated with reading performance later in life. (See Stanovich, Cunningham & Feeman, 1984). Once children have learnt to read, they can help themselves learn the more difficult aspects of the language (Elley & Mangubhai, 1983), as long as their interests are fostered in reading programmes. The teaching of reading therefore, is not a mere matter of teaching children skills and information related to the decoding of print. The task is not fully or successfully achieved if children show no interest in reading and seldom use the skill. It is only when children have found reading a source of information and pleasure that they have acquired a tool for future learning. These aims of reading education are precisely those embodied by approaches such as LEAR where teaching starts from where the children are, taking into account their interests and progress levels, and leading them on to learning of skills which are essential to future learning. ■

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# The Development and Acquisition of Concepts in Primary School Children in Singapore

*E Thomas**

## Introduction

What follows is an account which summarises a study that took 18 months to complete and which examined concept development and acquisition in a sample of Singapore primary schoolchildren. For more details the reader is to refer to Thomas, Lee, Fam, (1984a). The broad aim of the study was to obtain baseline information on children's cognitive development mainly through the application of Piagetian tasks.

The last decade or so has seen in many countries of South East Asia a growing amount of research carried out into the way children develop and understand concepts. The UNESCO Regional Conference on the Development of Scientific and Mathematical Concepts held in Bangkok in 1972 was the main stimulus to this work.

By now, many ASEAN countries have data reflecting developmental norms based on the Piagetian Paradigm (Opper, 1977, 1978 and 1980). However, Singapore has only limited information in this field (SEAMEO-RECSAM, 1978). This lack of information deprives the teachers, teacher educators, educational researchers and curriculum developers of essential baseline data on the intellectual development of Singapore children. Such information on intellectual development is crucial, if the quality of educational practice is to improve in Singapore. The same cry goes out for moral, emotional and social development too.

In view of the emphasis in Singapore on children to develop their intellectual potential as much as possible during their pre-primary and primary school years, there is clearly a case for tackling the job of mapping out their pattern of intellectual development. Once this has been accomplished, other facets of children's development can be investigated e.g. the pre-school years, language development, and social cognition.

From the above, the rationale for embarking on research into the conceptual development of Singaporean primary school aged children is patently clear. Unless there is some baseline data which provides the teacher with 'readiness' indicators of the pupils learning; the teaching process is likely to become ineffective. In short, by researching into the cognitive development of children in Singapore, it is hoped to obtain both universal comparisons as well as local developmental norms to improve the curriculum processes in the republic.

## The Piagetian Paradigm as a Framework

Piaget's developmental theory is a well known basis for research into cognitive development and although it has its critics, it provides educationalists with a well tried framework to study the development of mental processes in children. Moreover, it appears that the universal nature of the Piagetian framework gives broad guidelines to the 'readiness' of pupils in the various subjects of the school curriculum. In view of the above, it was decided to use a selected set of measures taken from Piaget's research on children. These were modified for use in Singapore and have relevance to what is studied in the primary school curriculum.

Much of the framework for researching cognitive development in this study is therefore based on the Piagetian Paradigm, but the concept of the Piagetian stage is not taken as the main unit of development

* The author greatly acknowledges the valuable assistance of his colleagues Florence Lee, Amy Fam, Kathleen Chan, Eunice Tay, Paula Tan, Ethel Own of the Institute of Education, Singapore and serving teachers in Singapore, Christine Lee of Toh Tuck Secondary School and Peter Kwang, Poon Kum Heng both from Hwa Chong Junior College.

in view of recent criticisms based on research findings (Driver, 1980). Care needs to be exercised when assigning stages of development to children of various ages in the context of schooling as a blind acceptance of stages may promote too rigid an expectation of what a child may be capable of understanding. Developmental stages are taken in this investigation as reference points providing valuable guidance to children's intellectual growth. They are not seen as precise labels referring to absolutes in children's mental development.

## Organization and Preliminary Studies

As the project was the first of its kind in Singapore, a programme of training was organized for the team of staff and student field workers which numbered 20 in the two pilot studies, ending with 9 personnel in the final study. Many methodological problems of a cross-cultural nature were encountered, such as the selection of task materials and the preferred language or dialect of the interviewee (Thomas, Fam, 1984).

These preliminary studies attempted to ensure the *validity* and *reliability* of the tasks as far as possible. A further result was the production of a small effective band of field workers. Although the basic aim of the study was to obtain baseline information on children's intellectual development, the preliminary studies helped greatly in drawing up clearer aims and objectives for the main study.

## Aims and Main Research Objectives

### *The Aims*

**1** To acquire baseline data on concept development of Singaporean primary schoolchildren.
**2** To provide a basis for follow-up studies in cognitive development.
**3** To examine the implications of the findings for primary school practice in Singapore.
**4** To make recommendations for the improvement of learning and teaching programmes in primary schools.

### *The Research Objectives*

**1** To investigate the development and acquisition of logical-mathematical, conversational, spatial-geometrical and causal concepts in primary school children attending Primary 1 — 6.
**2** To investigate sex differences in the development and acquisition of concepts cited above in 1.
**3** To examine what relationships exist between children's performance in selected primary school examinations and assessment of their developmental status.
**4** To examine selected inter-task trends.

## The Design and Sample

The design of the study was cross-sectional, covering an age spectrum of 72 — 180 months (see Appendix 1). The sample of 667 children attempted to reflect a Singaporean primary school population covering Primary 1 — 6 (see Figure 1). The ethnic composition reflected national proportions while the number of boys and girls were about equal. Parents of the children tested came from all SES categories and lived in different types of accommodation; but the majority of children had parents who worked in manual, semi-skilled/skilled occupations and lived in high rise flats (see Appendix 2). The sample was taken from five primary schools selected by the Ministry of Education which attempted to meet our sampling criteria.

## The Tasks and Other Experimental Details

In all, nine developmental tasks were administered in varied sequences (to control for practice effects) on the same occasions and on a one-to-one basis. The preferred language or dialect of the interviewee dictated the language of the interview. Tasks such as seriation (class/number), liquid, weight and area conservation, horizontality, geometrical area and causality measured *concrete operational* thinking. Volume conservation and aspects of the causality task measured *formal operational* thinking. For further details of the tasks, the reader is referred to Thomas *et al* (1984a) and Appendix 3.

Standardized measures of children's achievement in Mathematics, English, Science and Second Language results were obtained from school records for children attending Primary 4 and 6 classes respectively in the five research schools supplying children for the total sample.

The developmental tasks were translated from the English version into Chinese (Mandarin), Malay and Tamil by a combination of 'back translation' and 'committee' approaches (Thomas, Fam, 1984). In the case of Chinese children, field workers who

**FIGURE 1 — SHOWING DESIGN AND SAMPLE COMPOSITION***

| Total N1 | Primary Class | N2 | Sex | N3a + b | Median Age (in months) | |
|---|---|---|---|---|---|---|
| 667 Ss | 1 | 109 | M<br>F | 53<br>56 | 78 | Application of 9 developmental tasks to each S |
| | 2 | 115 | M<br>F | 56<br>59 | 90 | |
| | 3 | 114 | M<br>F | 55<br>59 | 102 | |
| | 4 | 110 | M<br>F | 55<br>55 | 117 | |
| | 5 | 104 | M<br>F | 48<br>56 | 130 | |
| | 6 | 115 | M<br>F | 58<br>57 | 156 | |

**Key**

N1 = total sample
N2 = sample per primary class
N3a = sample of male Ss per primary class
N3b = sample of female Ss per primary class

M = Male
F = Female

Ss = Subjects

* Ethnic and SES proportions subsumed in N2 and N3

were competent in Cantonese, Hokkien and Teochew used these dialects when the need arose.

All interviews were tape recorded and this ensured effective transciption of responses as well as a means for attaining a reliability index between researchers. The inter-rater reliability for 50% of subjects' tapes was 93%.

## Data Organization

The data was organized in two ways for appropriate analyses to be made. The *Primary School Class* was one unit of analysis while *Specific Age Span*, e.g. 72 — 83 months was used as an alternative unit. The use of the former unit formed the main point of reference in interpreting the findings of the study, as it was seen to have more direct relevance to relating the implications of the results to the school curriculum. The latter unit was valuable for providing a purely developmental picture of children's patterns of cognitive development. Reference will be made mainly to the Primary class unit in this paper but readers are directed to the main report for details concerned with the alternative unit of analysis.

## Response Categorization

### *(i) Non-Casual Tasks*

The presentation of the results follows the method used by Hyde (1970) and Thomas (1971) in which children's performance on 8 of the 9 developmental tasks (*exclusion of causality*) is assessed on a three-category basis. The reason for this method of presentation is that it gives one of the three indicators of the level to which a child has acquired a particular concept without tying him too closely to a particular stage. It also provides a more direct point of reference to the principal unit of analysis namely the *Primary School Class*. The three categories are as follows:

**(a)** A positive category (+) indicates a clear appreciation of the concept during the course of task administration,

**(b)** transitional category (T) indicates a partial appreciation of the concept,

**(c)** a negative category (−) indicates a child's inablility to appreciate the concept throughout the task.

For example in the case of *conservation of liquid substance* the three categories were arrived at on the following bases:

- A *positive category* (+) is given to the child who says the amount is the same (*identity*) or if the water is poured back it is the same (*reversibility*) or he can multiply the relations of height and width and understands the sum of the parts is equal to the whole (*compensation*).
- A *transitional category* (T) is given when a child is able initially to say the amount of substance is 'the same' but either cannot explain it or gives incomplete vacillatory answers as the task continues.
- A *negative category* (−) is given to a child who does not say and explain that the quantity of liquid is the same; there is a complete absence of conservation.

*(ii) Causality Task*

The task on causal relationships is categorized differently from the others. Piaget's original 17 types of explanation were abandoned in view of their overemphasis on pre-causal explanation and their lack of detail on the concrete and formal operational modes of causal thinking. A system devised by Thomas (1981) and modelled on previous work of Nass (1956) was used as it provides a more sensitive measure to children's causal explanations. The task also included an experiential component which forms an essential source of information for analysing causality from an educational as well as developmental standpoint. Therefore the task on causal thinking comprises two components:

**(a)** a *causal component* with six categories of response,

**(b)** an *experiential component* also with six categories of response differing from those measuring the causal component.

A guide to the categories of the *casual component* are as follows:

| Category | Principal Characteristics | Descriptio |
|---|---|---|
| 1 | Full, Accurate, Logico-causal Explanation | Logico-causa |
| 2 | Partial explanation lacking full content within logical explanation | Partial Logico-causa |
| 3 | Descriptive and attempts made at a logical causal explanation | Descripto-causal |
| 4 | Purely descriptive with no attempts made at a logical causal explanation | Descriptive |
| 5 | Pre-causal Explanations | Pre-causal |
| 6 | Don't Know | |

and for the *experiential component:*

| Category | Source |
|---|---|
| 1 | School — did it in class |
| 2 | Self — saw or did it himself |
| 3 | Family including Mother, Father, Siblings, Friends |
| 4 | Media including TV, radio, newpapers |
| 5 | Books read at home or school library |
| 6 | Don't Know |

## Discussion of Results

As the present paper is a summarized version of an extensive investigation, only profiles of children's results from each of the Primary Class units will be presented and discussed. The figure representing the profiles for the *non-causal* tasks show only those children achieving a positive status.

Due to lack of time and space only brief reference will be made to sex differences and inter-task trends, while comments of a general nature will be made to the findings on the children's casual thinking. A separate paper on causal thinking in Singapore Primary School children will appear in a future issue of this journal which will deal in more detail on the appreciation of causal concepts.

Therefore, figure 2 presents the numbers of children having positive status on the 8 non-causal developmental tasks for each of the Primary Class 1–6. Table 1 shows F values for results obtained on non-causal tasks after an Anova treatment. Table 2a and 2b show the correlation coefficients obtained when children's results on achievement tests from

**TABLE 1 — SHOWING F VALUES OF POSITIVE STATUS OBTAINED FROM PRIMARY 1–6 FOR 8 DEVELOPMENTAL TASKS**

| Task | F Value |
|---|---|
| Logico-Mathematical Seriation | 13.25* |
| Logico-Mathematical Relationship — Class and Number | 6.69 |
| Conservation — Liquid Substance | 11.73* |
| Conservation — weight | 22.48* |
| Conservation — Area | 16.13* |
| Conservation — Volume | 22.79* |
| Spatial — Geometrical Area | 20.18* |
| Spatial — Horizontality | 14.48* |

* $p < .01$

**TABLE 2 — SHOWING CORRELATION COEFFICIENTS* FOR SCHOOL ACHIEVEMENT TASKS AND DEVELOPMENTAL TASKS FOR PRIMARY 4 AND 6**

**Table 2a — Primary 4** (N = 110)

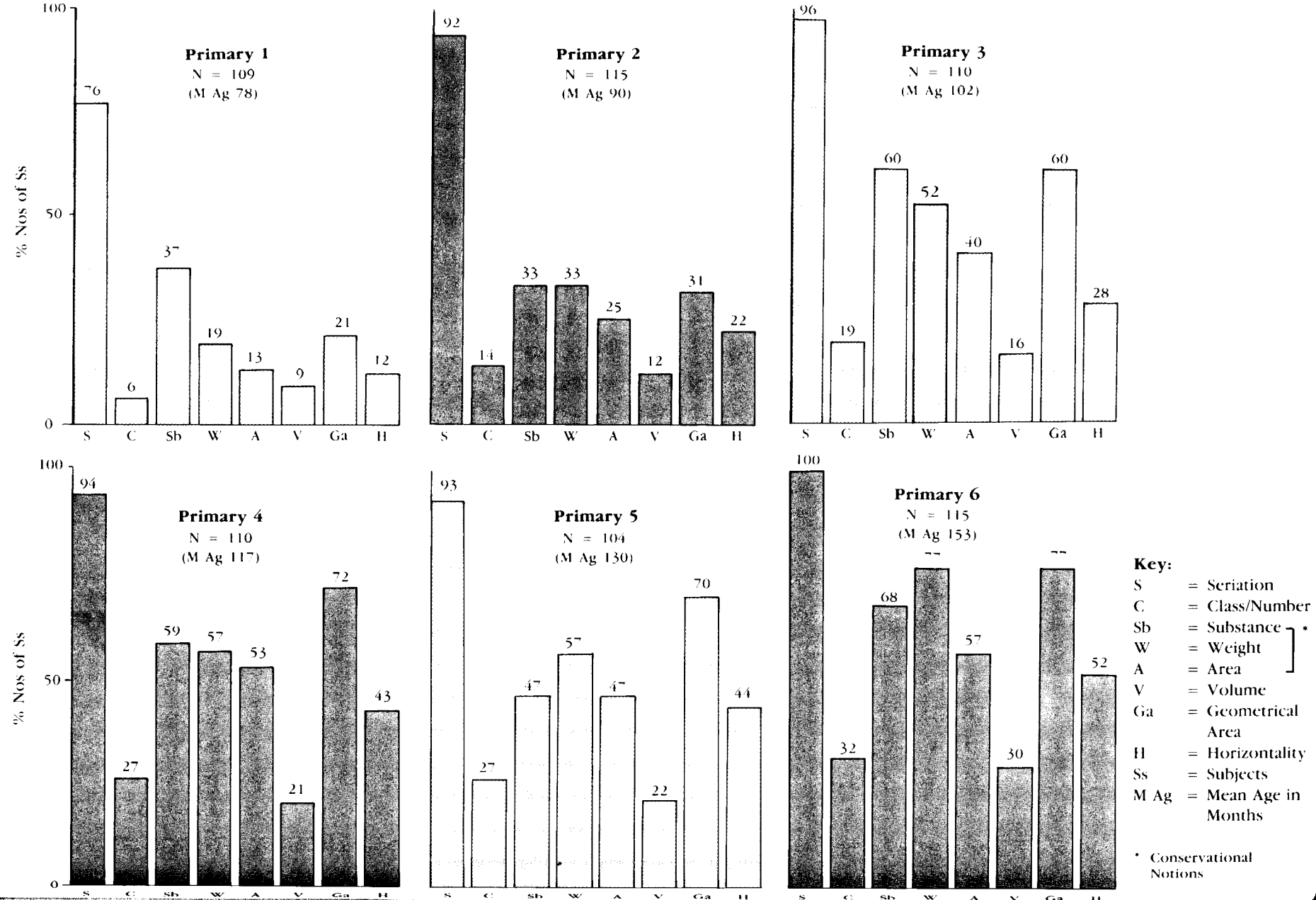
| Developmental Task | School Subjects | | | | Overall Assessment |
|---|---|---|---|---|---|
| | English | Maths | Second Language | Science | |
| Class/Number | .37043 | .47290 | .45236 | .10322 | .46214 |
| Conservation — Substance | .25000 | .25000 | .16827 | .05712 | .23470 |
| Conservation — Weight | .44310 | .50538 | .39802 | .13694 | .47290 |
| Conservation — Area | .23747 | .34800 | .25515 | .02917 | .28013 |
| Conservation — Volume | .36179 | .38651 | .28597 | .18467 | .36720 |
| Spatial — Geometrical Area | .33135 | .42538 | .27726 | .22438 | .35460 |
| Spatial — Horizontality | .25718 | .35647 | .18493 | .17900 | .28832 |
| Causal 1 — Car Movement | .33708 | .38891 | .27901 | .26109 | .35792 |
| Causal 2 — Cloud Movement | .42844 | .45715 | .34095 | .16671 | .42683 |
| Causal 3 — Death Origin | .19414 | .26536 | .27506 | .04015 | .25843 |

**Table 2b — Primary 6** (N = 115)

| Developmental Task | School Subjects | | | | Overall Assessment |
|---|---|---|---|---|---|
| | English | Maths | Second Language | Science | |
| Class/Number | .34326 | .34665 | .06590 | .33563 | .31724 |
| Conservation — Substance | .44610 | .37948 | .35716 | .43259 | .41402 |
| Conservation — Weight | .49003 | .33765 | .31921 | .46952 | .49055 |
| Conservation — Area | .28399 | .36858 | .13903 | .46958 | .36273 |
| Conservation — Volume | .36353 | .42331 | .22030 | .45986 | .44024 |
| Spatial — Geometrical Area | .25000 | .32376 | .09871 | .23005 | .29715 |
| Spatial — Horizontality | .34275 | .33864 | .21776 | .36416 | .42188 |
| Causal 1 — Car Movement | .20175 | .26424 | .24736 | .29291 | .28566 |
| Causal 2 — Cloud Movement | .09930 | .20928 | .16314 | .23403 | .17443 |
| Causal 3 — Death Origin | .06477 | .25000 | .13622 | .21776 | .19439 |

* Values below 0.25500 are not significant at the .01 level.

FIGURE 2 — PERCENTAGE NUMBERS OF SUBJECTS REGISTERING POSITIVE RESPONSES ON DEVELOPMENTAL TASKS



Primary 4 and 6 are compared to their performance on all 9 developmental tasks.

### *(i) Non-Causal Tasks*

In the search for baseline information on these children's cognitive development, reference to Figure 2 and Table 1 indicate that fairly distinct positive patterns of developmental change can be detected. That is, comparing the distribution of children's positive responses for all developmental tasks in Primary 1 to those distributions in Primary 6, the numbers are significantly different. However, closer examination of the results for each of the Primary Class Units show several interesting features. Generally, the number of children in *Primary1* and *Primary 2* who can appreciate class/number relationships, substance and weight conservation is lower than expected and even seriation for Primary 1 children was difficult for 34% of the sample. However, appreciation of spatial concepts such as geometrical area and horizontality provided encouraging levels of attainment.

In examining the results for *Primary 3* children we note a marked increase in the number of children registering positive responses to all tasks except class/number. Performance on the spatial concepts of geometrical area and horizontality continued to show encouraging evidence of more than expected levels of attainment. However, the numbers of children conserving liquid substance were below the expected levels for this mean age.

The profile for *Primary 4* children indicates more or less expected results for seriation, conservation of weight, area, volume and horizontality. However, the number conserving liquid substance and those appreciating class/number relations were low. Geometrical area, however, provided a higher than expected result.

When the profiles for *Primary 5* and *Primary 6* are examined, there are, on the average, increases in the numbers of children registering positive responses (although decreases are, however, recorded for some tasks in Primary 5). Nevertheless, there is a slowing down in the rate of increase. While the results for seriation, volume, conservation and spatial geometrical tasks compare favourably with other findings for these tasks, the numbers conserving liquid substance and weight are on the low side and especially the number of children appreciating class/number relationships. A consistent feature of the Primary 5 and 6 results is the increase in the number of transitional responses* which indicates that many children in several tasks e.g. substance, weight, area, volume, conservation and class/number relationship are not far off appreciating these concepts.

### *(ii) Casual Tasks*

A very definite feature running through most of the results for all three types of causal situation (car movement, cloud movement and death origin) was the large preponderance of 'descriptive' and 'descripto-causal' explanations. This was a feature for all primary classes 1 – 6. While there was evidence of more advanced forms of causal explanation registered for Primary 5 and 6, children in the main gave causal explanations that were confined to one, two or three word utterances even after the employment of successive probing, and even when the preferred language or dialect was used in the interview.

It may be sufficient to say at this stage that the low numbers of children registering more advanced forms of causal explanation particulary at Primary 5 and 6 give cause for concern.

### *(iii) Performance on Developmental Tasks and School Achievement Tests*

The correlation coefficients in Table 2a and 2b are for Primary 4 and Primary 6 respectively. The achievement test were administered several months before the children were tested on the developmental tasks. In the case of Primary 4, questions were used from a Ministry of Education source, while the data for Primary 6 are results of tests given prior to the Primary School Leaving Examination (PSLE).

PRIMARY 4

In general, the results indicate that what is taught and tested at Primary 4 bears only a moderate relationship with their performance on developmental tasks. Results of the application of developmental tasks indicate the level the child has reached in his mode of thinking.

The school results reflect the type of teaching and learning children receive and this seems to be somewhat different from what developmental task indicate here. This difference is probably a major reason why the correlations are on the moderate side. However, the highest sets of correlations are with mathematics for all the developmental tasks, and this gives some encouragement to the results. On

* These results can be referred to in Thomas et al (1984).

the other hand, the consistently poor correlations with science in Primary 4 is, however, depressing.

While bearing in mind that no developmental task is perfect, and that allowance be made to account for cultural and linguistic features of each child, it appears that the features which these particular developmental tasks attempt to test e.g. relationships, comparisons, reasoning, perceptual invariance are insufficiently emphasized at Primary 4. Therefore, attention should be given to incorporating into curriculum materials, learning strategies and teaching programmes more enlightened ways of *selecting*, *emphasizing*, and *assessing* what the developmental tasks are testing.

PRIMARY 6

By and large, the results show that a moderate to low relationship exists between measures of children's conceptual development and their performance on school achievement tests. Apart from the findings for causal thinking, the correlation values are higher than that for Primary 4. Futhermore, the relationship with science is also higher and therefore more encouraging, which possibly indicates that children's ability to appreciate relationships, perspectives, invariance and groupings at this age (12.8 years median) is reciprocating in some part their school attainment.

### *(iv) Sex Differences*

In the cases of seriation, conservation of weight, volume and casual thinking, no significant differences were recorded. In the tasks of class/number, conservation of substance and geometrical area and horizontality, there were isolated instances of significance reflecting differential performance between males and females in the various primary classes. Chi square ($\times^2$) values of significance when they did occur were all at the .01 levels of significance. Girls did better on class and number relationships and area conservation, while boys did better on conservation of liquid substance, geometrical area and horizontality.

### *(v) Inter-task trends*

It was shown that several interesting inter-task trends emerged from an examination of the results. Briefly these included:

**(a)** that conservation of weight was better understood than substance conservation for most primary schoolchildren, when the reverse is the norm for these Piagetian tasks,

**(b)** children were consistently better at appreciating geometrical area than conserving area and this was found to be the case for all Primary 1 — 6, and

**(c)** children were better at using *recognition strategies* than drawing when it came to understanding horizontality. Again this was found to be the case for all Primary 1 — 6.

For more detailed information and possible explanations for the sex differences and inter-task trends the reader is referred to Thomas *et al* (1984).

## Overview and Implications for Primary Education in Singapore

Carrying out research into cognitive development in Singapore has on the one hand, the disadvantage of having very litter previous data to refer to; so studies at present are bound to have an element of the pioneer about them. On the other hand, Singapore provides an unusually rich substratum for all types of study into children's developmental and learning potential. The fact that so many studies have been conducted into the cognitive development of children outside Singapore has meant that an investigation such as this one, and any future studies, can be planned and operationalized with the selective experience and hindsight of previous work. In the course of the investigation, many important issues and problems were encountered. These may be clustered under three main headings:

(a) Developmental
(b) Methodological
(c) Educational

### *(a) Developmental*

The Piagetian Paradigm has been the subject of substantial research in many countries over the past 10 years and it is tempting to draw too fine a comparison between findings from these countries. Even within the Western context, developmental norms must be examined with caution. It is necessary to examine carefully the type of sample studied, the detailed nature of the task and task materials, as well as the cultural context. Of particular importance in carrying out cross-cultural cognitive developmental research with the Piagetian paradigm as a framework, are (a) the nature of the interview as a research tool in a cultural context where one-to-one (E - S) situation is not the norm, (b) competent

translation of the instruments so that experimenter and subject can understand one another adequately.

It was found that in the present study, both factors are likely to play a part in explaining the results. However, although these two factors were controlled for as adequately as possible, some account of them must be taken when comparing the results with the Genevan norms. The fact that although the trends for each task were developmental, the actual numbers of children giving positive responses are in several cases on the low side. It would appear that apart from the two factors mentioned above, several others could contribute to the explanation of the trends. These include the lack of opportunity for children to engage in explanation and for teachers to foster it. It seems that insufficient opportunities are given for children to handle and manipulate materials in class. These explanations emerged in discussions with teachers and pupils during the study, and probably all play a part in accounting for the trends.

However, it must be pointed out that Singapore schoolchildren seem to possess well established recognition and mathematical skills, and these give them more than an edge on their western counterparts in appreciating spatio-geometrical relationships in developmental tasks such as geometrical area and horizontality.

### *(b) Methodological*

A detailed appraisal of the main methodological problems encountered in this investigation has already been given by Thomas and Fam (1984) in which the three main areas of Language, Task materials and Acculturation are discussed. Therefore this cluster will not be treated here.

### *(c) Educational*

From the results a number of general educational observations can be made. These are:

(i) That most children's language, be it the preferred local one or English, seems to be inadequately mastered for them to express understanding (or misunderstanding) of the concepts that were probed. The norm seemed to be very short, abrupt, repetitious replies to many of the questions.

(ii) Another feature was the rather low to moderate relationship that exists when children's results on achievement tests for Primary 4 and Primary 6 are compared to their performance on developmental tasks. It appears that what is taught does not tap sufficiently the quality of childrens' thinking. This was particularly borne out by the less than average performance of children in explaining causal relationships, and on class/number, volume and substances conservation tasks.

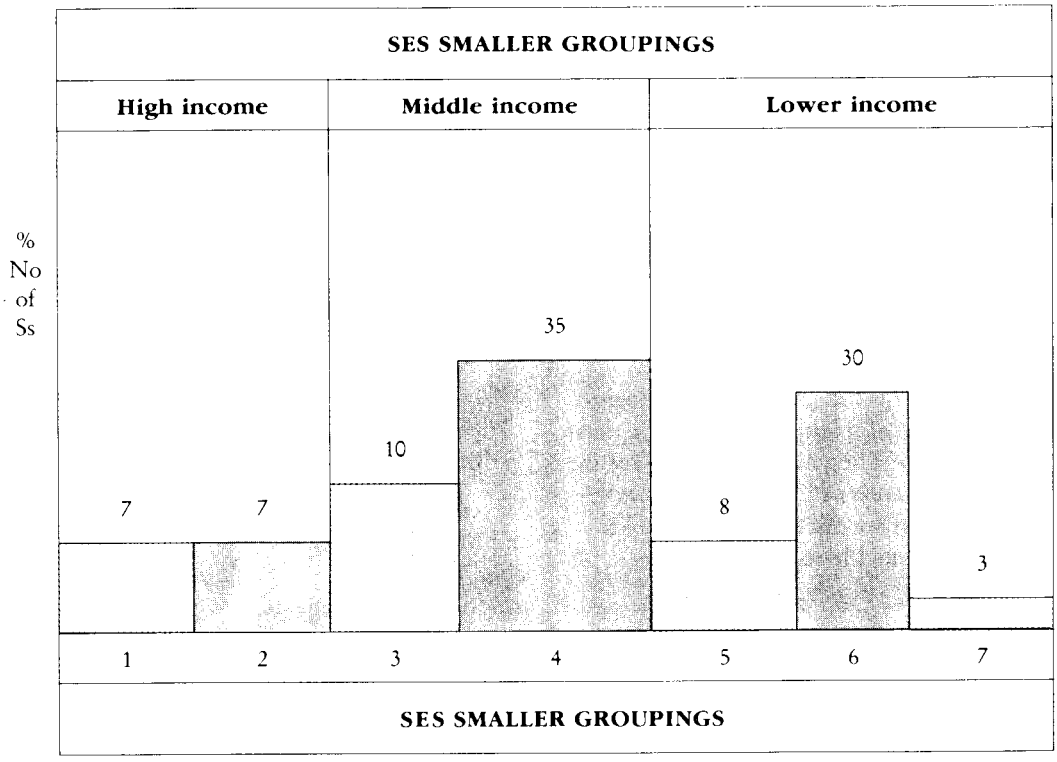
(iii) The occurrence of plateaus at the various primary class levels especially Primary 5 is interesting but difficult to explain. It is clear that for this sample, at least 'levelling off' periods and even 'regressions' are features in the later primary years when this should not be the case. It appears the pace of development slows down with less numbers of children appreciating many of the concepts tested. It may be that plateaus and regressions are a result of such school factors as examination pressure and encouragment of rote learning before understanding. Again, the limited emphasis on relevant action procedures to accompany learning in school may also be a responsible factor. The insufficient encouragement at home and school for children to read, question and explain during their pre-primary and primary years pose another set of conditions that may be considered in explaining the trends met with in this investigations.

To improve concept development and acquisition, children of primary school age and earlier, if possible, should be given many more opportunities of handling and manipulating materials to enhance the later as well as the earlier stages of concept acquisition. Both the school and the home environment have crucial roles to play in this process. Furthermore, the teaching of the preferred local language as well as English should receive priority in its role in concept learning and understanding, with every opportunity given by teachers to encourage questioning and explanation in day-to-day classroom activities.

## APPENDIX 1
## TABLE SHOWING DETAILS OF SAMPLE AGE

| Primary Class | N | Mean | S.D. | Minimum | Maximum |
|---|---|---|---|---|---|
| 1 | 109 | 78.0 | 3.599 | 72.00 | 89.00 |
| 2 | 115 | 90.51 | 3.638 | 83.00 | 96.00 |
| 3 | 114 | 102.596 | 4.727 | 95.00 | 120.00 |
| 4 | 110 | 117.17 | 7.528 | 104.00 | 144.00 |
| 5 | 104 | 130.52 | 7.435 | 120.00 | 156.00 |
| 6 | 115 | 153.71 | 9.623 | 135.00 | 180.00 |

## APPENDIX 2
## TABLE SHOWING % DISTRIBUTION OF CHILDRENS' PARENTAL OCCUPATION* FOR THE WHOLE SAMPLE** (N = 677)




* Key: The SES groupings are the Ministry of Labour's classification and supplied by MOE.
Broadly the smaller groupings are as follows:
Grouping 1 Professional
2 Managerial
3 Paraprofessional
4 Skilled Workers
5 Trade Commerce
6 Semiskilled
7 Unemployed

** The pattern of these distributions is reflected for each of the Primary Class 1-6.

## APPENDIX 3
## BRIEF DESCRIPTION OF TASKS

### 1. Seriation
This task involves 9 sticks increasing regularly from 5 – 15 cm. The child views a correct model and constructs a seriation. Nine more sticks measuring 5.5 – 15.5 cm are given at random for insertion into the original construction done by the child.

### 2. Class/Number
The child is presented with 10 bananas and 2 oranges and asked whether they constitute the super-ordinate fruit. This is followed by questions concerning relationships between the two types of fruit, e.g. more or less, etc.

### 3. Conservation of Liquid Substance
This task involves the appreciation of conservation using coloured water, two equal-sized glass tubes, and a long thin glass cylinder.

### 4. Conservation of Weight
This task requires the children to appreciate weight conservation by comparing two equal-sized plasticine balls and then rolling one of them out into an elongated shape.

### 5. Conservation of Area
This task uses two equal paper rectangles one of which is cut to make a long-based triangle.

### 6. Conservation of Volume
Two groups of centimetre blocks are arranged in two different ways. Each group contains the same number of blocks. Reference is alo made during the experiment to water displacement with regard to the two arrangements.

### 7. Geometrical Area
One card with a shape made up of 81-centimetre squares is compared with a similar single 1-centimetre square. A second card with a shape made up of an assortment of squares and triangles is compared to a similar single triangle. The purpose of the task is to probe a child's appreciation of area.

### 8. Horizontality
Thia task uses a conical flask, quarter filled with coloured water, standing horizontal and covered with a piece of cloth. The same procedure is adopted for a round-bottom flask. The child is probed with questions and asked to draw the horizontal on prepared drawings of flasks standing at different angles.

### 9. Causal Thinking
This is a purely verbal task that has two components: a *causal*, probing different experience levels, e.g. familiar, remote malfunctional; and an *experiential* component, probing the childrens' source of information.

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# Role of Task-related Factors in Assessing Young Children's Logical Ability in Class Inclusion

*Seng Seok Hoon*

One of the ways in which we assess children's logical competence is to ask them questions. This is based on two rather weak assumptions — first, that they understand these questions in the same way adults do and secondly, that logical operations are required to answer these questions. However, since at the start, the child does not know the intentions behind our question, he has to consider the form in which the question is posed and use whatever contextual cues or clues are available to make a correct inference. Relevant information may or may not be contained in the question or the external context. Sometimes, both question and context contain these information, and variation in either can lead to a correct or incorrect answer, independent of the logical abilities theoretically being assessed.

The purpose of this article is to examine how perceptual, semantic, referential and comparison processes are affected by contextual variation in a cognitive development task. The central thesis is that logical ability cannot be assessed independently of these processes and that what develops cognitively is a broader competence than just competence in logical operations. The nature of this problem is exemplified in the steady stream of studies dealing with the Piagetian stage concept in intellectual development, and with the pre-operational to concrete-operational stage in particular.

The Piagetian model of cognitive development is a comprehensive and general theory of the growth of children's understanding of the world around them. Its main premise is that in the course of development, the child passes through an invariant sequence of stages, each of which represents a unique level of analysis, internal mental organization and understanding of environmental information and events. In the Piagetian system, the pre-operational stage, which corresponds approximately to the period between two and six years, is marked by egocentric and transductive qualities. This unique stage of development is also inferred from the absence of certain cognitive operations such as conservation, transitivity, seriation and class inclusion. These operations are based on tasks which required the child to comprehend language related to relative and absolute quantity (e.g. more, less, same, larger than, smaller than). Successful performance on the task is indicated by the production of some appropriate verbal responses or explanation by the child. The child's performance on these tasks is thought of as reflecting directly on the child's competence without considering the various situational or contextual factors involved in the specific tasks (Carmi, 1981).

There is evidence suggesting that task-specific variables as well as cognitive capacities may be important factors involved in children's failure to demonstrate proficiency on traditional cognitive tasks (Siegel, 1978). Donaldson (1978) has demonstrated that if the cognitive tasks used to assess performance are incongruent with everyday experiences, then these tasks do not make much sense to the young child. The role of familiarity, language and other subtle factors is also convincingly demonstrated by Gelman (1978). A recent study done by Thomas and Fam (1984) indicated a methodological problem in linguistic communication on a series of cognitive developmental tasks. This is of special significance in a multi-lingual society like Singapore. With regard to the language typically used in these cognitive tasks, there is a huge body of evidence showing significant deficiencies in the young child's understanding of relational terminology. With young children, linguistic aspects of assessment are particularly important. My own experience in the current Bernard van Leer project study on the cognitive development of pre-schoolers in Singapore has

shown that 3 to 6-year-old children could not comprehend terminology such as more, less same and longer. Also, children in this age range often make errors indicating an incomplete understanding of words such as big, small and little. If there is some reason to suspect a lack of linguistic competence on the child's part, then failures on these tasks may be due to either his lack of the cognitive operation being tested or his inability to comprehend and produce the required language or of course both.

The particular task that will be examined in this paper is a problem of critical importance within Piaget's theory, namely class inclusion. Questions and hypotheses have been formulated concerning the relation between the cognitive abilities of children necessary to complete this task successfully and the particulary contextual factors involved in the task. Class inclusion is the logical and critical end point in the development of young children's classification behaviour (Kofsky 1966). For Piaget, the concept of classes and relationships among them form the building blocks of intellectual thought. Thus, the acquisition of this concept is a skill of major significance. The ability to compare a superordinate class with its subordinate classes and to perform reversible operations on quantitative classes is supposed to mark the transition from pre-operational to concrete operational thought (Trabasso *et al* 1978). Piaget concluded that class inclusion competence is lacking when children resort to a comparison of the two subclasses.

Theoretically, there has been little argument about the class inclusion logical operation. However, a considerable number of experiments have been done on variants of the class inclusion task itself (Wohlwill, 1968; Tatarsky, 1974). These and later studies have shown conflicting results. Task manipulations which have been replicated or modified can or cannot facilitate class inclusion performance. It appears that the typical class inclusion task may be tapping not only inclusion competence but other task-related abilities as well. It also suggests that class inclusion performance can be influenced by different degrees of task variation — an issue which Piaget did not investigate directly. Reviews by Winer (1980) and Trasbasso, Isen, Delecki, McLanahan, Riley and Tucker (1978) have all indicated that large differences in children's behaviour can result from a wide variety of task manipulations of the standard class inclusion task. Several studies have indicated the significance of more than one effect but they do not examine interaction effects between certain kinds of task variables.

## Use of Redundant Cues: Perceptual Manipulation

In most class inclusion problems, the superordinate class is more abstract than its subclasses. For example, 'cats' and 'dogs' might be the major and minor subclasses, and 'pets' or 'animals' the superordinate class. Such superordinate classes do not suggest clear perceptual representations, but require a degree of abstraction as a basis of classification. Part of the apparent difficulty with class inclusion problems may be due to the abstract nature of the superordinate relative to the subclasses. The subclasses, when displayed, are clearly visible and concrete and are in this way better defined than the superordinate class. 'Dogs' and 'cats' are more easily concretely represented than the concept of 'animals'. Hence, if the superordinate class can in some way be made perceptually identifiable or more salient, class inclusion performance may be enhanced.

Wilkinson's (1976) design was one of the clearest and most direct manipulations of the perceptual features of the superordinate class. He modified the salience of the superordinate class by referring to distinctive perceptual features of that class. The class inclusion problem incorporated distinctive features of both the subclass and the superordinate class. For example, the children were shown line drawings of three adult figures, all of whom had a chair, two of the adults were women with a picnic basket and one was a man without a picnic basket. The standard class inclusion question was: 'Are there more mothers (A) or more grown ups (B)?' and the distinctive feature question was: 'Are there more grown ups who have a picnic basket (A) or more grown ups who have a chair (B)?' With the standard question, children gave the correct answer 23% of the time but when specific identifying features were used for the classes, the children were correct 60% of the time.

This study shows one way in which redundant cues can facilitate class inclusion performance. However, it raises the question whether children use counting rather than semantic means to solve inclusion problems. If this is so, then children are not making a class inclusion comparison, but are simply counting and comparing two disjunctive classes. A possible interpretation is that the use of distinctive cues identifying superordinate class enables the child to see clearly which comparison is called for.

McGarrigle, Grieve and Hughes (1978) manipulated the visual cues of the superordinate class in a similar manner. Using three block plastic cows and

one white cow, all lying down, the researchers compared the standard Piagetian question 'Are there more black cows or more cows?' to the modified question 'Are there more black cows or more sleeping cows?' The average number of correct responses increased from 25% for the standard question to 43% for the altered question for children between five and seven.

### Presence of an Extraneous Superordinate Class

Another perceptual manipulation used by several researchers (Wohlwill, 1966; Isen, et al, 1978) had the effect of making subclass comparison more difficult. This was done by adding a class of objects to the display unrelated to the original superordinate class. Such additional extraneous items would theoretically increase the salience of the superordinate class so that children would be likely to make the correct response. Performance was in fact improved when the additional items were used. Similary, Wohwill (1968) facilitated performance by adding a few objects that were not members of either subclass. Presumably, these additional objects allowed the child to perceptually contrast the class in question with other objects. Isen et al (1975) sought to enhance this effect by providing another superordinate class as a contrast to the one being asked about. He included transfer tests to single-class problems and found improved performance with the transfer. Evidently, perceptual cues which increase the salience of the superordinate class by the addition of an extra class, facilitate children's inclusion performance.

### Use of Verbal Cues

In the class inclusion task, the child's verbal responses are frequently the only performance data available to the investigator. This being so, it is important to explore the relationship between the type of class inclusion question, verbal cues and class inclusion performance (Siegel, 1978). A number of studies have modified the class inclusion question with verbal cues, and corresponding changes in class inclusion performance have been observed.

Shipley (1979) distinguished two types of class inclusion question and demonstrated that children who failed the standard class inclusion question often improved when relevant linguistic cues were provided. The form of the standard question she used was: 'Which is more, the lemons or the fruit?' The altered question was: 'Which is more, only the lemons or all the fruit?' Hodkin (1981) reported results and an interpretation which were consistent with Shipley's studies. Hodkin used the word 'all' to modify the superordinate class. For example, her modified question form was: 'Are there more Smarties or more of all the candy?' Children three to eight years old gave more correct answers to this question than to the standard Piagetian question. The single modifier 'all' was sufficient to improve performance.

Other researchers have also noted that to a large extent, the difficulty with the class inclusion problem is a linguistic one. In particular, Shipley (1979) and Winer (1974, 1978) maintain that children fail the inclusion problem because they erroneously interpret the questions as involving mutually exclusive classes. This shows how minor changes in the spoken class inclusion question can dramatically alter the child's response. Studies have indicated that the difficulties with the class inclusion problem lie with the child's response to verbal cues as well as perceptual cues. In fact, investigators have tried to identify the separate effects of verbal and perceptual effects but have not tried to examine both effects together.

### Salience of the Superordinate Class

There has been some indication that the nature of the stimuli being classified effects class inclusion performance. In Inhelder and Piaget's study, for instance, questions involving animals as the superordinate class were much more difficult than those involving flowers. Dogs, birds and insects were selected as representative subclasses for the animal (superordinate) class. It was also observed that incorrect answers for the animal class continued to be given, up to a later age than for the flower class. Inhelder and Piaget's explanation of the variable class inclusion responses was that children were more familiar with flowers than animals.

Research by Brown (1958) indicates that poor class inclusion performance may be linked to difficulty in labelling the subclasses as good exemplars of the superordinate class. Brown found that children learn to label objects which make up classes such as 'animals' in a different manner from the way in which they label objects which belong to classes such as 'flowers'. The labels learnt for the 'animals' category are invariably subclass labels like 'dog' and 'cat', whereas the label learnt for the objects in the 'flowers' category is invariably the superordinate class label itself, 'flower'. Brown argued that the child learns more specific (subclass) labels for objects which the adult expects him to distinguish but he

learns the general (superordinate class) labels for objects which he is not expected to distinguish. Thus the specificity or generality of object labels acquired by the child is a function of the discriminatory abilities expected of him by adults.

Carson and Abrahamson (1976) demonstrated that the class inclusion skills of children in grades one to four depended on the extent to which stimuli are good examples of a category. They had hypothesized that some subclass would be more representative of a larger superordinate class and would therefore be easier for children to include in a count of the larger class. For example, 'horses' and 'dogs' were considered better exemplars of the 'animal' category than 'flies' and 'bees'. When children were shown horses and dogs and asked the class inclusion question 'Are there more horses or more animals?' they performed better than when shown horses and flies or dogs or bees.

Evidence from the foregoing studies indicates that assessment of class inclusion competence depends upon the particular superordinate category selected and the relative salience that the superordinate class label has in relation to the subclass label. Therefore, the selection of the superordinate class category and the elements within the superordinate class category is critical when designing class inclusion tasks. Some of the subclass exemplars are almost always called by their superordinate labels (eg. violets are called 'flowers' and banyan is called 'tree'). The superordinate labels in these cases are therefore highly salient relative to the specific subclass names.

When we are studying class inclusion performance, we are not only assessing class inclusion competence. There are many task variations which affect children's responses to inclusion questions. To examine carefully the effects of these task requirements, class inclusion studies need to be analyzed according to predominantly perceptual, linguistic or class content manipulations. A common element inherent in all facilitative manipulations is the emphasis of the superordinate class in some way or another. This has the effect of minimizing the most common error made in class inclusion tasks, that is, subclass comparison.

Four important task manipulations have emerged as significant themselves. These have met the criteria of statistical significance, with at least one successful replication without disconfirmation and clearly stated procedures. They are:

1. adding redundant cues to the superordinate class,
2. adding an extra superordinate class to the array,
3. adding the verbal cue "all" to the superordinate class and
4. using a highly salient superordinate class label.

An investigation of these four task manipulations and their interaction, which has been seriously omitted in previous studies, will throw some light on how task variations affect class inclusion performance. In so far as perceptual and verbal manipulations can be seen as influencing the way in which information is being coded, such a study should be of value to researchers who wish to look at class inclusion closely from an information — processing point of view..

## Implications For Learning And Teaching

The study of task manipulations in the class inclusion task has several general implications for learning and teaching hierarchical concepts. Besides increasing an awareness towards on understanding of classificatory behaviour of young children, similar studies have revealed that class inclusion for the young child is not an easy task. This difficulty is consistent with the findings of the Genevan investigations. Most five and six year old children are not successful in this task. According to Piaget, they are unable to think of the whole and the part simultaneously and it would follow that their ability to think of the whole-and-part of heirarchical concepts is similary limited.

One implication is clear. It is recommended that in the kindergarten and lower primary school curriculum, procedures should be developed for learning class inclusion along with the formation of hierarchical concepts. In developing these procedures, we need to determine means which are not only effective in relation to learning class inclusion, but which are also appropriate for classroom practice.

One procedure for developing class inclusion is indicated in the writer's previous finding that significantly more kindergarten children were successful on functionally or meaningfully-based class inclusion tasks. The meaning a concept has for a child is related to the modes of representation he uses in organizing his world. Bruner and Olver found that of the six-year old children who formed a genuine category or class, the majority did so on the basis of the common function concerned in all the items. Tasks containing such items appear to be much easier for young children. Therefore, it seems reasonable to suggest that the initial work in developing the principle of inclusion might be more

effectively accomplished by using functionally defined heirarchical concepts in the learning tasks.

This suggestion has one implication related to concept development in school practice. Since the use of meaningful items in classifying seems to be prevalent in young children, perhaps the experiences provided for children need to be analysed with them. The functional aspects can become the basis of classifying, and opportunities can be given for the child to classify functionally. Meaningful and functional attributes can be stressed in developing concepts.

Attention needs to be given to the structure of concepts included in the curriculum. The structure includes features such as the defining properties of the concept (*intension*), membership in the class represented by the concept (*extension*), class composition and hierarchical level. In the past the analysis of concepts used in curricular development for young children has been concerned with dimensions such as concreteness-abstractness and familiarity-unfamiliarity. These dimensions certainly still need to be considered in making decisions about the selecting of concepts for the curriculum. In addition, it is suggested here that attention to the structural dimensions of concepts will enable us to achieve greater congruence between the concepts to be formed and the child's cognitive processes. Furthermore by being aware of the structure of concepts, one can more adequately plan for assimilative and accomodative experiences.

The indication that the young child is unable to hold the whole and the part in mind simultaneously has implications for classroom practice. It would seem important for the teacher to recognise at what points the young child's cognitive processes may not be keeping up with the course of an activity concerning hierarchical concepts. For example, in working with a hierarchical concept, such as farm animals, are kindergarten children able to keep up with transitions that may occur in discussing a subclass, e.g. cows, in relation to the whole class and vice versa? Do they understand the inclusiveness of a concept such as farm animals? In other words, do they really understand that there are more farm animals than cows.? Close attention needs to be given to the cognitive requirements involved in conceptual activities designed for young primary children. Hence, the development of cognitive readiness has to be emphasized and extended more systematically into the area of concept development in the kindergarten curriculum.

Suggestions for developing cognitive readiness are implicit in the current body of research on children's cognition. In relation to hierarchical concepts, this readiness programme would need to be concerned with developments, such as:

1. multiple classification of items in the content;
2 delineation of primary and secondary classes;
3. overt awareness of the criteria governing particular classification;
4. flexibility in classifying i.e. being able to change the criterion upon which a classification is based and being able to recognized and choose among alternative ways of classifying particular elements.

This research has implications for the longstanding practice of using tasks structured to assess children's acquisition of specific conceptual abilities. It has been customary to presume that children between the ages of 5 and 10 can cope with language used in such tasks. Evidence has shown that this presumption is not warranted. Many investigations have pointed out the importance of the total situation in which a sentence is heard in determining how a child interprets that sentence. Research, however, has concentrated primarily on non-linguistic factors while the possible effects of the linguistic context and the interaction between it and non-linguistic factors in the total situation have not been studied. Task language, in addition to other situational factors, should be considered both in designing tasks to assess conceptual abilities and in interpreting the results obtained from them.

The way in which the language is used by the child is far more complex than might have been expected. It has been observed that there is considerable complexity in the child's use of language in contexts of comparison, description and discrimination. This has clear implications for the study of semantic development and linguistic comprehension. An estimate of the child's ability to correctly interpret linguistic meanings should be sensitive to the type and context of question with which we attempt to elicit responses.

One must constantly keep in mind that language does not simply involve words that name objects. Objects can be referred to in various ways, depending on the context. If we wish to understand the processes underlying the child' responses across various contexts, we must look and see how the child is using the language. Further inquiry must not only consider what motivates the pre eight-year old to use the language of standard class inclusion problems in a way different from the adult, but also

what underlies the responses of post eight-year-old children who use the language in a way similar to the adult. What underlies this change? It seems as if this will only be uncovered by an intensive longitudinal study of individual children which may be useful in attaining a more accurate account of why children may be so vulnerable to situational cues. ■

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# Modifying Negative Attitudes Towards School Work Through Group Contingencies

*Visawanathan Leela*

## Introduction

Teaching a class of secondary school students can be either an exciting or a frustrating experience. Some students tend to be enthusiastic and self-motivated when engaged in certain learning tasks, but the evidence for poor motivation and a lack of enthusiasm is also present. The task of teaching demands that we should not lose sight of the fact that one of our primary responsibilities is to provide effective academic instruction in our classrooms. When we encounter some classroom problems such as negative attitudes towards school work, we should therefore not dismiss the difficulties as insurmountable, nor should we assume that because of their age, behaviour modification procedures will not be effective for secondary school students.

The main concern of the project reported here was to modify the attitude towards school work of a class of secondary school students. By providing a carefully structured learning experience, the students were helped to change their negative attitudes to more positive ones.

## Theoretical Basis of the Study

The common techniques used to alleviate the persistent problems of learning and behaviour are those derived from learning theories and based on behaviour and task analysis. The concept of behaviour modification has received increasing attention in professional literature (Beth Sulzer, 1982; Saul Axeford, 1977) and such an approach is based on the following premises:

**(a)** Maladjusted behaviour, like well-adapted behaviour, is considered to have been learnt. Therefore, it can be unlearnt and substituted by the teaching of adaptive behaviour.

**(b)** All behaviour (both academic and social) is susceptible to being changed by the manipulation of the child's environment.

**(c)** It is possible for maladaptive behaviour to be changed in a child's most natural educational environment, ie. his normal class group. The teacher can bring the child's behaviour under the control of reinforcers that exist in the child's learning environment.

**(d)** The child's behaviour is a cue for educational action and desired responses are a basis for future learning.

This approach involves making a clear statement of objectives, observing, analysing the task and evaluating the outcome of the teaching programme. It encourages positive thinking in a child because it focuses on desired behaviour in a context of praise and success instead of focusing on failure and misbehaviour in a context of criticism. In fact, behaviour modification techniques are best viewed as one set of teaching techniques which should be part of every teacher's repertoire.

## Purpose of the Study

The ultimate goal of the study was to create a stimulating and productive learning experience so as to facilitate positive changes in the students' attitudes towards school work and, ultimately, towards learning. In a study by Kounin (1970) it was found that teachers who could handle behavioural problems successfully were those who minimized their occurrence in the first place. In this study, the behaviour modification approach was attempted by developing a group contingency system to minimize the occurrence of some identified negative behaviours towards work and to change some of these negative behaviours into positive ones. Changes in behaviour were used as indicators of a change in attitudes.

## The Study

The study was carried out on 42 pupils in a secondary one class consisting of 23 girls and 19 boys, most of whom were between 13 and 14 years old. Basically, the study involved observation and recording of the behaviour being modified. The frequency count technique which is a simple method of making a count whenever a particular behavioural act or event occurs was chosen. With the frequency count during the baseline (initial) period, I assessed the behaviour which contributed towards negative attitudes to schoolwork. Key behaviours were therefore observed and recorded. These were then brought under 'control' in the intervention (experimental) programme through the use of positive reinforcers whenever appropriate behaviour occurred.

There were two periods of study, the Baseline Period and the Intervention Period.

### *(a) The Baseline Period (1 week)*

Before implementing the programme, some baseline data had to be obtained. This information was used firstly to identify the specific behaviours to be modified, and secondly, to compare with the subsequent data to see if the reinforcement procedures had been effective

During this period of 5 days, essential data was recorded during and after their Mathematics lesson (I was their teacher). Only the main negative attitudes towards schoolwork were observed and recorded. They were:

( i) Handing in books late
(ii) Forgetting to bring text books
(iii) Failure to do correction
(iv) Submitting incomplete work
( v) Producing untidy work

### *(b) Intervention Period (4 weeks)*

Pupils were told of the 'game' for their Mathematics subject, and that the project was planned specially to help them develop positive attitudes towards the subject in the five areas listed below:

( i) Handing in books on time
(ii) Bringing their textbooks
(iii) Doing their corrections
(iv) Submitting complete work
( v) Producing neat work

Pupils were encouraged to participate fully in the game. They were also promised rewards or back-up reinforcers for the individual with the best score and the two best winning teams at the end of the intervention period. To ensure that the reinforcers or rewards awarded were appropriate and appreciated by the students, a discussion was held with them. Decoupages, files and book marks were chosen as rewards. In monitoring the progress of the pupils the following apparatuses were used:

*(a) Diary Cards:* These were used to record individual pupil's scores daily. On each card, attitudes or behaviours to be measured were listed so that the pupils would be motivated to work hard at changing their behaviour. A new card was used for each week.

*(b) Score Charts:* These served to show the scores earned by individuals as well as groups on a weekly basis. There were two main charts — the 'Individual Score Chart' and the 'Group Score Chart'. It was expected that both would increase the momentum of the competition and pupils would be motivated to keep up the scores.

## The Intervention Programme

Participation in the programme was on a row by row basis. Students with negative attitudes towards Mathematics were scattered to ensure equal distribution of different types of students in each group. Each students was given one diary card by the six appointed leaders. Everyday, the group members handed in their cards together with the exercise books to their leaders. The group leaders then exchanged their group cards with other group leaders for recording. This was done to prevent unfairness in scoring.

The 'Group Contingency Management' was done in three stages, according to the schedules of reinforcement:

***First Stage: Continuous Reinforcement (2 weeks)***
Here reinforcement in the form of points was given at each occurrence of positive response. So during each day of the two weeks, group leaders monitored the behaviour exhibited by students. Pupils obtained five points for each positive behaviour exhibited and zero point if otherwise.

***Second Stage: Intermittent Reinforcement (1 week)***
In this stage, every third response was reinforced and then every second response in the five days of

the week. In other words, although group leaders recorded all positive behaviours observed, pupils were awarded points only at the end of the third day of the week and then again at the end of the fifth day.

*Third Stage: Intermittent Reinforcement (1 week)*
In this final stage, the final points for each positive behaviour exhibited were only awarded at the end of the fifth day.

At the end of the third stage, the group leaders and I added up the scores of all the four weeks to determine the two best groups and the individual who scored the most points. These pupils and groups were subsequently rewarded. To sustain the pupils' effort, I continued to check their books and reward inproved work by writing encouraging remarks on their books such as: 'You are doing better', 'You are improving', 'That's neat work', etc. The idea was to gradually substitute extrinsic motivation with intrinsic motivation.

## Results and Analyses

Two types of evaluation were carried out in this study. The first was the evaluation of the behaviour of individual pupils. The other was based on the overall performance of groups in the four-week programme. From these evaluations, it was possible to ascertain how much pupils had improved (or otherwise) in their behaviour and therefore, how much they had changed in their attitudes towards their schoolwork. It was from these evaluations that the overall success or failure of the project is to be assessed.

In the first four days of week 1, pupils were 100% cooperative and handed their books on time. However, on the fifth day, one offence was committed, giving a mean of 0.2, and it was further increased to 0.8 in the following week. But this was temporary as in the subsequent two weeks, better performance was observed. The overall percentage of improvement in this aspect of their behaviour was 81.8%.

The greatest success was recorded in this aspect of their behaviour, as by the end of week 4, not a single pupil failed to bring his book to class.

As can be seen in table 3, the behaviour observed showed good improvement in the first week although there was a relapse in week 4. This might be due to the fact that a few pupils did not know how to do their correction and I could not help them in time as they were to hand in their books during the first period.

From table 4 we can observe a decrease in the number of times when pupils failed to complete their work. This was further brought down to a mean of 0.2 in week 2. Although there was a slight increase in the mean in week 3, that was only temporary as in the final week the pupils showed overall improvement.

**TABLE 1 — ATTITUDE TOWARDS THE HANDING IN OF BOOKS**

| Period of Observation | Number of times pupils failed to hand in books | | | | | | |
|---|---|---|---|---|---|---|---|
| Day / Week | 1 | 2 | 3 | 4 | 5 | Total | Mean |
| Baseline | 2 | 1 | 3 | 1 | 4 | 11 | 2.2 |
| 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0.2 |
| 2 | 0 | 1 | 0 | 1 | 2 | 4 | 0.8 |
| 3 | 0 | 0 | 1 | 1 | 0 | 2 | 0.4 |
| 4 | 0 | 0 | 0 | 1 | 0 | 1 | 0.2 |

Average Mean of Offences for Week 1 to Week 4

$$= \frac{0.2 + 0.8 + 0.4 + 0.2}{4}$$

$$= 0.4$$

Therefore, Percentage Improvement in Behaviour

$$= \frac{(2.2 - 0.4)}{2.2} \times 100\%$$

$$= 81.8\%$$

**TABLE 2 — ATTITUDE TOWARDS BRINGING TEXTBOOKS TO CLASS**

| Period of Observation | Number of times pupils failed to bring textbooks to class | | | | | | |
|---|---|---|---|---|---|---|---|
| Day / Week | 1 | 2 | 3 | 4 | 5 | Total | Mean |
| Baseline | 7 | 4 | 12 | 3 | 2 | 28 | 5.6 |
| 1 | 2 | 1 | 1 | 0 | 0 | 4 | 0.8 |
| 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0.2 |
| 3 | 0 | 0 | 1 | 0 | 0 | 1 | 0.2 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |

Average Mean of Offences for Week 1 to Week 4

$$= \frac{0.8 + 0.2 + 0.2 + 0.0}{4}$$

$$= 0.3$$

Therefore, Percentage Improvement in Behaviour

$$= \frac{(5.6 - 0.3)}{5.6} \times 100\%$$

$$= 94.6\%$$

**TABLE 3 — ATTITUDE TOWARDS DOING CORRECTION**

| Period of Observation | Number of times pupils failed to do correction | | | | | | |
|---|---|---|---|---|---|---|---|
| Day / Week | 1 | 2 | 3 | 4 | 5 | Total | Mean |
| Baseline | 6 | 3 | 9 | 2 | 2 | 22 | 4.4 |
| 1 | 2 | 3 | 0 | 0 | 0 | 5 | 1.0 |
| 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0.2 |
| 3 | 0 | 0 | 0 | 2 | 0 | 2 | 0.4 |
| 4 | 2 | 1 | 0 | 0 | 0 | 3 | 0.6 |

Average Mean of Offences for Week 1 to Week 4

$$= \frac{1.0 + 0.2 + 0.4 + 0.6}{4}$$

$$= 0.55$$

Therefore, Percentage Improvement in Behaviour

$$= \frac{(4.4 - 0.55)}{4.4} \times 100\%$$

$$= 87.5\%$$

**TABLE 4 — ATTITUDE TOWARDS COMPLETING WORK ASSIGNMENTS**

| Period of Observation | Number of times pupils handed in incomplete work | | | | | | |
|---|---|---|---|---|---|---|---|
| Day / Week | 1 | 2 | 3 | 4 | 5 | Total | Mean |
| Baseline | 4 | 1 | 1 | 3 | 2 | 11 | 2.2 |
| 1 | 3 | 0 | 0 | 0 | 2 | 5 | 1.0 |
| 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0.2 |
| 3 | 0 | 0 | 0 | 3 | 0 | 3 | 0.6 |
| 4 | 1 | 0 | 0 | 0 | 0 | 1 | 0.2 |

Average Mean of Offences for Week 1 to Week 4

$$= \frac{1.0 + 0.2 + 0.6 + 0.2}{4}$$

$$= 0.5$$

Therefore, Percentage Improvement in Behaviour

$$= \frac{(2.2 - 0.5)}{5.6} \times 100\%$$

$$= 77.3\%$$

**TABLE 5 — ATTITUDE TOWARDS PRODUCING NEAT WORK**

| Period of Observation | Number of times work was handed in | | | | | | |
|---|---|---|---|---|---|---|---|
| Day / Week | 1 | 2 | 3 | 4 | 5 | Total | Mean |
| Baseline | 4 | 7 | 4 | 8 | 4 | 27 | 5.4 |
| 1 | 10 | 0 | 0 | 0 | 3 | 13 | 2.6 |
| 2 | 2 | 3 | 2 | 2 | 1 | 10 | 2.0 |
| 3 | 0 | 0 | 0 | 4 | 0 | 4 | 0.8 |
| 4 | 0 | 1 | 0 | 0 | 1 | 2 | 0.4 |

Average Mean of Offences for Week 1 to Week 4

$$= \frac{2.6 + 2.0 + 0.8 + 0.4}{4}$$

$$= 1.45$$

Therefore, Percentage Improvement in Behaviour

$$= \frac{(5.4 - 1.45)}{5.4} \times 100\%$$

$$= 73.1\%$$

On the first day of week 1, the group leaders recorded a great number of 'offences' when untidy work was handed in. Also there was some confusion as the group leaders themselves were not clear what constituted 'untidy work'. The problem was solved when the criteria of 'untidy work' were listed for the whole class. After that, the pupils showed gradual improvement in this aspect of their school work.

**TABLE 6 — EVALUATION OF GROUP PERFORMANCE**

| | Number of occurrence of negative behaviour observed | | | | |
|---|---|---|---|---|---|
| **Group** | **Week 1** | **Week 2** | **Week 3** | **Week 4** | **Total** |
| 1 | 10 | 14 | 4 | 2 | 30 |
| 2 | 3 | 0 | 0 | 0 | 3 |
| 3 | 4 | 0 | 2 | 1 | 7 |
| 4 | 6 | 2 | 4 | 4 | 16 |
| 5 | 4 | 1 | 2 | 0 | 7 |
| 6 | 1 | 0 | 0 | 0 | 1 |
| Total | 28 | 17 | 12 | 7 | 64 |

**TABLE 7 — IMPROVEMENT IN BEHAVIOUR OF THE WHOLE CLASS**

| *Period of Observation* | *Number of occurrence of Negative Behaviour* | *% Improvement* |
|---|---|---|
| Baseline Period | 99 | — |
| Intervention Period Week 1 | 28 | 71.7 |
| Intervention Period Week 2 | 17 | 82.8 |
| Intervention Period Week 3 | 12 | 87.9 |
| Intervention Period Week 4 | 7 | 92.9 |

As can be seen in Table 6, the reinforcement system had an immediate effect on the behaviour of the groups. Most of the groups showed a gradual decrease, with slight fluctuations, in the number of occurrences of negative behaviour. Group 1 committed the most 'offences' and that was because there were two pupils whose untidy work was more difficult to modify. However, by the fourth week, it managed to reduce the number of 'offences' to only two. This reflected great effort on their part to change their own behaviour.

Table 7 compares the general behaviour of the class during the Baseline Period and during the four-week Intervention Period. Before the implementation of the Behaviour Modification programme, a total of 99 occurrences of negative behaviour was recorded. The number dropped remarkably in Week 1 of the Intervention Period to 28 and it further decreased in the following weeks. In the last week of the Intervention Period only 7 occurrences of negative behaviour were recorded. It is obvious that the programme had some effect in changing the negative behaviour of the pupils.

## Conclusion

From all the above analyses, it can be stated that some identified problem behaviours have been reduced and a considerable degree of change towards more positive attitudes of the students towards school work has been achieved. Through the use of a token reinforcement system, together with classroom group contingencies, pupils were motivated to develop self-control over their behaviour and the increase in self-control also enabled them to have more harmonious relationships among group members. That, in turn, had an impact on individual learning and behaviour. In this way, it allowed the

shaping and maintaining of essential learning habits which are prerequisites for increased achievement.

The project has also demonstrated the usefulness of *score charts which are helpful and important in any behavioural programme. Not only did they help students improve their scores, they also provided some feedback of the groups' performances and thus served as an important tool in motivating learning.*

*Even though the overall result was encouraging, there were some difficulties in carrying out the project. Firstly,* the size of the class posed a problem as it was not easy to observe 42 pupils simultaneously. *Secondly,* the application of behaviour modification procedures was often hindered by problems in determining age-appropriate reinforcers. *Lastly,* the fact that these secondary school pupils had classes with many teachers sometimes made the organization of the programme difficult.

Despite the limitations mentioned above, this study proved that it is possible for teachers to use suitable and effective behaviour management strategies in the classroom. It is clear that the teacher's and pupils' contribution to learning is thereby enhanced. ■

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SPECIAL SECTION

The three papers on educational research by Husén, Wolf and Kida are slightly revised versions of addresses delivered at the Open Day Session of the 25th General Assembly of the International Association for the Evaluation of Educational Achievement held in Singapore in August 1984.

# Educational Research in a Meritocratic Society

*Torsten Husén*

## Introduction

Educational research deserving the name is bound to be closely related not only to the pressing problems of the practitioners in the field, but to the burning issues which policy makers try to come to grips with as well. Even though (Husén & Kogan, Eds., 1984) — and rightly so — researchers, as true academics, often emphasize the importance of tackling fundamental problems, they cannot avoid being affected by the priorities set by the policy makers. These priorities are reflected in how research funds are allocated to various fields. To be sure, researchers are like other human beings: they are not insensitive to money. Like bees they tend to flock to the flowers where the most attractive nectar is to be found.

Thus, depending upon the overall educational policy there are observable differences in the orientation and type of educational research conducted in various countries. Let me cite three examples: the United Kingdom, Sweden, and the United States. I think that although none of these countries has a particularly meritocratic system, the experience gained from them has bearings on the situation in Singapore.

In the United Kingdom, both before and particularly after the passing of the 1944 Education Act according to which secondary education for all should be provided according to ability, the overriding problem researchers dealt with was how to 'allocate' or 'select' for the three types of secondary education. As a matter of fact, the task in practice boiled down to how to select for the grammar school type of education, i.e. the 11-plus selection. How could one optimize the predictive efficiency of various indicators of academic ability so as to minimize the number of mistakes made in the 11-plus examination? In a way, the National Foundation for Educational Research (NFER) in England and Wales was a product of the 1944 Act. The research activities of the late 1940s and early 1950s are presented in a nutshell in the reports authored by Yates and Pidgeon (1957) at the NFER and Philip Vernon (1957) on behalf of the British Psychological Society.

The role of educational researchers in the sorting and sifting of the 11-year-olds was conceived by most of them, particularly if they had their background in differential psychology, as being a purely technical one: how to improve the system. Few of them critically studied the system as such. An exception at an early stage was Jean Floud and her co-workers (Floud *et al.*, 1956) who widened the perspective and asked the crucial question to what extent the 11-plus system contributed to increased equality of opportunity between the various social classes.

In Sweden various governmental commissions from 1946 to 1961 dealt with the restructuring of the nine years of mandatory schooling from a selective and parallel system to an elective and comprehensive one (Husén, 1962; Husén & Boalt, 1968). This had during almost two decades a strong impact

on what researchers in education did. The crucial problem was, even among those who accepted a comprehensive structure of the British kind, what type and what mode of differentiation should go into the system so as to maximize the possibility for the individual to realize his or her potentiality and to bring about more equality of opportunity. The key term labelling the issue therefore was 'differentiation' around which a high proportion of both commissioned and non-commissioned research was conducted (Husén, 1962; Svensson, 1962; Dahllöf, 1967; Husén & Boalt, 1968). The various studies focused on the pros and cons of the comprehensivization issue. In the first place, what would happen to the bright students if they had to be taught together with the less able ones? What would be the consequences of a selection at an early age on the more able and less able?

In the early 1960s there was in the United States an upsurge of commitments to school education on the part of the Federal government, most of it epitomized in the Elementary and Secondary Education Act (ESEA) of 1965 (Keppel, 1966). Federal support was by the Johnson administration conceived in the context of a 'war' against poverty, thus with a wider social purpose (Husén, 1979). Not least the Civil Rights movement contributed to making equality of educational opportunity a major objective in educational policy. But the ESEA also made provisions for implementing what Keppel referred to as a "revolution" in American education by making massive funds available for research and development. These resources were expected to improve the quality of school education. This was also the era of a suddenly awakened, strong belief in educational technology. The R & D centres which were set up at some universities were expected to come up with the "products" needed to improve instruction and to evaluate its quality. There was a wave of euphoric enthusiasm for R & D. The concept was taken over from industry, and educational researchers starved of funds went along with the hope that R & D would work the same wonders in education as it had done in manufacturing industry. When the bright hopes and expectations did not materialize the disappointment was the greater.

## Meritocracy — An Attempt to Clarify the Concept

The term 'meritocracy' was coined by Michael Young (1958) in his book *The Rise of Meritocracy*. The book was, in fact, in the Orwellian vein a brilliant diatribe, or rather a dystopia, by a radical critic and adviser to the Labour Party of certain features of the educational system in Britain, not least the selection by tests for grammar schools, and the consequences in the long run of such a system. The literal meaning of the term is that power is bestowed upon those who possess certain merits. A meritocratic society was operated according to the simple formula: $M = A \times E$, where M stands for merit, A for ability, and E for energy or effort. Expressed in sociological terms: in a meritocratic society, status and influence are achieved and not ascribed by wealth or social background. Ideally, in a meritocratic society those who are born smart are those who make it to the top. Conversely, the stupid are slipping down on the status ladder, even those with privileged background. Since formal education is the main instrument of social mobility, the higher up on the educational ladder one is able to climb, the better the auspices for a good place in the meritocratic hierarchy.

Thus, ideally in a meritocratic society status is achieved on the basis of inborn capacity. Differences between individuals in terms of economic and social conditions are therefore in the long run reflections of differences in inborn abilities. Social differences, to the extent that they do not reflect 'genuine' differences in ability, will be 'reshuffled' between generations and the individuals will take their respective places on the status scale according to what they deserve. Such a conception starts from the assumption that social mobility depends entirely, or mainly, on capacity of a cognitive nature and that competence acquired by social background can be regarded as negligible. In the first place, what was referred to as 'smartness' needed for success in school and working life is a combination of cognitive and non-cognitive characteristics. These are strongly affected by the milieu in which the individual grows up (Husén, 1974). We are indeed born very unequal *both* with regard to 'smartness' and home background. Some are right from the beginning 'more equal than others', to use an Orwellian expression. The home and the impetus it can provide for success or failure in formal education is of crucial importance (Husén, 1975). Differences in school achievements between various ethnic groups in, for instance, the United States provide clear evidence.

Competitive selection according to clear-cut criteria of talent and competence is the main instrument for implementing meritocracy.

## Challenges to Educational Researchers

What challenges does a meritocratic educational policy offer researchers? In principle, there are two kinds. The researchers can find incentives, not least financial ones, to investigate the purely technical problems encountered in implementing meritocratic policies. For instance, what methodologies would increase the efficiency of the selection system, as was the case in England before comprehensivization of most secondary schools or might now be the case in Singapore at the age of 9? Secondly, they can in accordance with the traditional academic role take a critical look at the policy itself and the assumptions upon which it is built. This is consistent with the academic ethos of exercising a critical function, which is not exercised by academics depending upon whether they are working inside or outside the university system. I think that in the long run, the second type of endeavour serves not only educational science but also education as such better. I shall, therefore, before pointing out more concretely what researchers can do, spell out what I mean by exercising a critical function.

In two books, *Talent, Equality and Meritocracy* (1974) and *The School in Question* (1979), I have subjected the school as an institution to critical scrutiny and have not refrained from making some sacred cows the target of my criticisms. Formal schooling has for a long time been seen by traditional liberals as the 'Great Equalizer' (Horace Mann). But the schools are there in the first place in order to impart competences.

Modern democratic society with universal franchise is beset with an awkward dilemma which is often denied or swept under the rug. There is a goal conflict between equality and excellence, and even more so, between populist egalitarianism on the one hand and selection for status all the way through school and working life on the other. The theory and practice of Mastery Learning developed by Benjamin Bloom is perhaps the most spectacular attempt to reconcile the two. There is, however, inevitably a certain amount of trade-off between them. But the trade-off is proportional to the validity of the two basic assumptions of meritocracy: impact of inborn ability and irrelevance of social background. Before pursuing this further, let me quote what I am saying in the concluding chapter of *Talent, Equality and Meritocracy* (Husén, 1974, p. 143):

> A pervasive problem in this book — one which looms on the horizon of the post-industrial society and with which educational policy makers will have to come to grips — is the dilemma of meritocracy versus democracy. The problem can be described by stating a series of antitheses. We have on the one hand the trend toward cognitive competence becoming the 'power basis', and on the other the quest for greater equality of life chances, coping power and participation. We have on the one hand the classical liberal conception of equality which entails a belief in careers being open to talent on the basis of fair competition, and on the other the radical democratic conception according to which the distribution of abilities is an arbitrary outcome of the 'natural lottery'. We have on the one hand the strongly felt need to improve educational opportunities for those classes who have until now been underprivileged, and on the other the immediate demands for highly trained technological and managerial manpower. We have on the one hand a strong popular demand for an 'open door' policy in higher education, and on the other an often dominant element of competitiveness.
>
> We have on the one hand the 'corrective' type of egalitarianism, according to which society should confine itself to correcting for certain differences in starting chances, such as putting all the competitors on scratch and then leaving it to individual initiative to take advantage of the equal opportunity provided; on the other there is the 'redemptive' egalitarianism which emphasizes equality of results and is ready to distribute opportunities in a compensatory way. Evidently, the resolution of this dilemma is a matter of value priorities. The goal of economic growth is inextricably linked to the creation of competencies conducive to meritocracy. The goal of redemptive equality can be achieved only by playing down the rewards, status and authority connected with superior competence.

In principle, therefore, the educational researcher should subject the theory and the fundamental concepts upon which a certain policy is based to criticism, reveal the goal conflicts and point out the logical consequences which sometimes are not consistent with the motivation behind a certain policy. But of equal importance are attempts by empirical methods to test the validity of the assumptions upon

which a certain policy is built or to bring out the concrete consequences of that policy. I think that the so-called 'Stockholm investigation' conducted at the Stockholm School of Education 1955 through 1960 is a good illustration of what can be achieved by survey methods in order to elucidate issues of school policy (Svensson, 1962; Husén, 1960; Dahllöf, 1967).

The focus of the Stockholm investigation was the problems of instruction and knowledge acquisition in undifferentiated and differentiated pedagogical milieus respectively. Educators dealt almost exclusively with the problems of what happened to the standard, particularly among the more able students, if there was no sectioning or streaming of them. But the problem of the social consequences of organizational differentiation was for a long time completely neglected. When we began to investigate this aspect of selection we found that whatever criteria were employed, selection was consistently correlated with social background.

## Agenda for IEA

As can be seen in the international publications, both from the first Mathematics Study and the Six-Subject Survey, IEA in its data analyses also tackled the problem of comparing selective and less selective national structures of education. Starting from the fact that the pre-university population, the 17- to 19-year-olds, varied considerably in relative size from country to country — from 9 per cent of the relevant age group in the Federal Republic of Germany to more than 70 per cent in the United States — it was deemed more appropriate to compare the standard of top students in the respective countries, for instance, the top one or five per cent. In terms of an age cohort going through the last year of secondary schooling, there was a continuum from very selective to nearly non-selective systems. In comparing achievements IEA was able to show that top students in American high schools by and large had reached the same competence as had those in, for instance, Germany and England (Husén, 1984).

This strategy of analysis raised the question of the price paid in a selective system for the high standard achieved among the few. Thus, as was shown in a longitudinal study in Sweden in the 1950s (Svensson, 1962), the price paid in selective systems consists of a high attrition rate in terms of grade-repeating and forced drop-out but, above all, of a social bias inherent in the attrition process. Those of humble social background or from homes where the parents have little formal education tend to be screened out much more frequently then those from privileged background.

In a way, such findings supported a comprehensive system of education. More did not necessarily mean worse. But in spite of the net being cast wider than in the selective system the top students in the comprehensive system were on the average not better, although they were taken from a larger pool of talent. There is, therefore, a certain amount of trade-off between selectivity and comprehensiveness, or, expressed differently, between a closed meritocratic system and an open system.

## The Problem of Reconceptualizing Selection Criteria

In spite of the massive research, not least in the United Kingdom, the technical problems encountered in using selection criteria are far from 'solved'. Selection for furthergoing formal education at the secondary and tertiary levels takes place according to various criteria of potential aptitude, such criteria being employed either separately or in combination. Such criteria are in principle of two major kinds: standardized tests, most of them measuring 'ability' or 'aptitude', on the one hand and indicators of scholastic achievements, such as marks, examinations and teacher ratings, on the other. In practice, this means using scholastic aptitude tests, more or less of the intelligence test type, with particular emphasis on verbal ability, standardized achievement tests, interest, attitude and personality tests, interviews, school marks and teacher ratings of scholastic aptitude, in addition to formal marks.

There is, as you well know, an enormous literature on the technical problems faced in using these criteria for predictive purposes in selection for further going academic schooling, particularly in the United Kingdom and the United States.

Is there, after all these efforts to study in detail the validity of various predictors, separately or in combination, anything left to be researched? Can the technicalities be looked at in a more refined way and with more sophisticated methods? Maybe not, but sometimes a big leap forward in a particular area can be made by reconceptualizing a problem which for a long time has been seen as unchangeable or simply taken for given. The idea of looking at the *social and/or ethnic bias* that can beset a given system of selection is one example of a conceptual reappraisal. It contributed to changing the views of members of

a School Commission in Sweden who thought that the problem of school structure was entirely one of making optimal predictions.

Another reconceptualization relates to the *impact of competitive selection* of the work that goes on in the school. How does the system affect student motivation? How much more do they work for external than for internal rewards? Or, more concretely, do they work mainly for examination and marks and neglect learning for its own sake? But learning that occurs because of its external rewards, or even because of coercion, cannot be considered entirely a bad thing. It can constitute the first stage of obtaining a genuine interest in the subject areas *per se*. Anyhow, it is worthwhile investigating. Such studies using IEA data become cross-national and much more interesting than if they were limited to one particular national setting.

In a meritocratic system of education the competition to go ahead tends to strongly affect the rule system in the schools and has repercussions of a bureaucratic and legal character. In an era when equality of educational opportunity is a major policy objective in many countries all over the world and when the degree of justice and fairness in whatever selection procedures employed is carefully watched, formal legislation that should guard justice is passed and the courts begin not only to implement but to shape educational policy as well. Cases in point can be found in Germany and the United States.

It appears to me that given the unique opportunity that is provided by the cooperative machinery set in motion by IEA, it is indeed close at hand to conduct comparative studies that focus on phenomena related to educational meritocracy of the kind I have pointed out. I would urge that a cross-national comparative study of what I would like to refer to as the 'meritocratic syndrome' be conducted. In such an investigation the validity of the assumptions behind a meritocratic policy and its consequences could be subjected to conceptual analysis and empirical study across different cultures. We are still faced with unexplained ethnic differences, such as the ones observed in a country like the United States. It seems to me that such a study could be woven into the project on transition from school to work, which is now in the planning stage.

## A Research Agenda for Singapore?

It would, with my limited experiences from your country, be highly presumptuous to propose a research agenda for Singapore. But given the rather strong meritocratic orientation of your educational system it appears to me that the following topics would be in line with what your system of education is trying to achieve:

**1.** How does the system, as it is operating now, in a rational way utilize the existing pool of talent? Are the highly gifted, whatever their background, getting opportunities to go ahead in the system? At what age, if any, should they be identified and differentiated from the rest?

**2.** An educational system cannot concentrate all its efforts on the gifted without neglecting the great majority of pupils, particularly the underprivileged. What teaching strategies could be developed so as to raise the general level of competence and avoid creating an educational underclass? What effects does the medium of instruction, when it is different from the mother tongue, have on student achievement?

**3.** Countries differ not only in terms of between-student variabililty but between-school variability as well (Comber & Keeves, 1973). There are IEA countries, where the between-school variability is only some 10 per cent of the between-student variability. On the other hand, there are those where the between-school variability is 30 to 40 per cent or more of the between-student variability. It is of utmost interest for a country to study differences between both students and schools and to identify factors associated with these differences. We know from studies conducted elsewhere that grade-repeating and strict ability-grouping tend to increase variance. Futhermore, grade-repeating is strongly related to social background and tends to discriminate against lower-class pupils.

## Concluding Remark

The debate on meritocracy versus egalitarianism or populism has, not least because of the conceptual clarification and empirical evidence contributed by social science, become much more sophisticated among academics, but I think by some kind of osmosis among policy makers as well. The vivid debate elicited by the first Coleman Report 1966 as well as the contributions by other sociologists and differential psychologists have been of great importance in this context. We have now a more tenable and realistic conception of the validity of the assumptions upon which a meritocratic policy rests and are aware of the goal conflicts that beset both meritocracy and egalitarianism. ■

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# Educational Research in a Meritocratic Society

*Richard M. Wolf*

When I was asked to prepare a paper to present at this meeting, I was delighted. I lived and worked in Singapore in 1981 and felt that I would have no trouble preparing a suitable paper. The more I pondered the topic, however, the clearer it became that the task was devilishly difficult. Let me explain why.

The topic of our symposium is 'Educational Research in a Meritocratic Society'. If one is going to show any fidelity to the topic, then much of educational research is immediately excluded. For example, I could hardly discuss what research has to say about the teaching of, say, reading or mathematics. These are issues that are common to education in *all* societies and, consequently, of questionable appropriateness to the topic of this symposium.

The question then becomes one of what can be said about educational research in a meritocratic society? Professor Husén has, as usual, pointed the way. He says that we can study the consequences of policies or the details of implementation. Since the former is one of Professor Husén's special areas of interest, he obviously goes off in that direction. I could discuss details of implementation but such matters are better presented in writing since the technical material involved is sure to lose even the most intrepid listener. I also get little satisfaction from reading statistical formulae to an audience.

I believe that there is a third course that is available. Educational research in a meritocratic society implies, among other things, making decisions about students. The traditional thinking is that a race is to be run and the prizes are to go to the swiftest. Selection has been around for a long time and we've all gotten pretty good at it. I would submit, however, that the typical selection problem is *not* a central problem facing educational research in a meritocratic society. In fact, I'm not convinced it's much of a problem at all. Singapore has a well developed selection system for secondary and higher education that works quite well.

In contrast to *selection*, where one is concerned about selecting the most able students to go on to a higher level, is the problem of differentiation. In differentiation, one is concerned about deciding which of a number of different paths is the most appropriate one for an individual to follow. I submit that this is a far greater problem than selection and one that Singapore as well as many other nations face. I want to devote the remainder of this paper to that problem.

In a meritocratic society, the real problems begin *after* selection occurs. For example, at the completion of a number of years of compulsory primary education and, perhaps, a year or two of lower secondary school, decisions are made as to who should continue to complete an academic secondary education and perhaps proceed on to university. The percentages of an age group selected to continue in an academic stream can vary enormously, but that is not the point. The point is that some individuals are selected and others are not. One big problem for a meritocratic society is deciding what to do with the individuals who are *not* selected to continue in an academic stream?

One thing that can not happen is to simply forget about them. Professor Husén points out, quite correctly I believe, that this would simply lead to more problems for the society. What happens generally and, most definitely in the case of Singapore, is that the bulk of the non-selected individuals are directed into a vocational stream. The task at this point is to allocate this group to a number of different training programmes — welding, auto mechanics, electronic technician, air-conditioning repair, carpentry, turning, joining and a dazzling array of additional specialties. How does one decide who should become what? This is no easy task and the answers are far from complete. We do have some ideas of what should be the ingredients of a differentiation system. First, decisions about differentiation require information about a *number of dimensions of aptitude.* In

academic selection, one can easily get away with using a verbal measure or a verbal and numerical measure. In differentiation into a multi-dimensional vocational system, we need information on a number of dimensions. Mechanical reasoning, spatial relations, clerical speed and accuracy as well as some dexterity measures are needed to adequately describe an individual. We also need to know something about what an individual is interested in in order for successful differentiation to take place. For non-academic students, it is vital that they be put into programmes for which they show some inclination, if not a well-developed interest, as well as some aptitude. The student, in effect, becomes a partner in the decision-making process. Furthermore, since the student is to be involved in making a decision as to what programme to enter, then the student must be as informed as fully as possible about the range of options available and have some notions about what is involved in each. This means having a guidance programme to prepare the student to participate in the decision-making process. How these elements are to be put together into the overall programme is not clear. We also need to have some sense of which test measures are related to success in a particular kind of programme. This involves a number of studies of the predictive validity of the measures in a test battery for a number of different programmes. Typically, what is found in such studies is that some measures will predict success in training in some programmes, other measures will predict success in other programmes and still some measures will probably be uncorrelated with success. The absence of negative results are not necessarily disappointing. They merely indicate that individuals at all levels of ability on a particular dimension can succeed (or fail) in a given type of training programme.

What I have been describing in outline form is what the Vocational Aptitude Project of the Vocational and Industrial Training Board of Singapore was seeking to begin work on. Project personnel had selected, adapted and done preliminary tryouts of a number of vocational aptitude measures. Our first results were highly encouraging. We found that we had multiple correlations of +.60 and higher for predicting success in various training programmes. This was significantly and meaningfully greater than any other set of predictor variables. Furthermore, the regression weights for the various aptitude measures *differed* for predicting success in different training programmes. This is not only crucial in differentiation but highlights the distinction between differentiation and selection. When aptitude testing is linked to a programme of vocational guidance, I am confident that there will be a differentiation system that will benefit both the individual and the society.

So far I have been discussing the notion of differentiation in the vocational sector. I believe that it is important to apply the same notions to the academic sector. Who should be chemists, engineers, doctors, and computer scientists? Information about general academic ability is not sufficient to help in making such decisions. Additional specialized ability measures along with measures of interest are necessary to help individuals make intelligent decisions that will be right for them and beneficial to society. Failure to do so is costly. Le me give one example just to suggest how costly bad decisions can be. In the United States, many students want to become doctors. Competition to get into medical schools is quite keen. With good tests and a high selection ratio, it is not particularly hard to select a high quality group of students for medical school. Yet, we do have students dropping out at the end of the first year of a four year course. With medical school tuition at an average of US$15,000 per year, the dropping out of a single student creates a vacancy in a class that cannot be filled. This means a loss of US$45,000 over the next three years, a not inconsiderable sum. It also means one less doctor that will be available. Multiply that out for just one field and aggregate it over all fields and you have some idea what the dollar cost of wastage is.

But there are even greater costs. Let me return to the field of vocational education again and report about a meeting I attended in New Zealand some years ago. At that time, nursing education had just moved from hospital based programmes into the Polytechnic. Nursing educators, eager to establish themselves in their new setting, were holding forth about the importance of their work, stressing the life and death nature of their field. I must say that they were going on a bit too much. After a while, an elderly instructor in the welding programme spoke up. He said that he recognized that the actions of nurses could result in life or death to patients. But, he added that nurses and doctors, even if they were grossly incompetent, could only kill one patient at a time. An incompetent welder, on the other hand, who was working on a building or an airplane, could make mistakes that could kill literally hundreds of people at once.

Now no one wants to kill people. But it is important to recognize that unwise decisions can lead to not only bad, but disastrous results. We want to avoid this at all costs. One way to do this is to make sure that decisions about differentiation are wisely

made. This, I believe, is a neglected area. Selection decisions in meritocratic societies have historically received a great deal of attention. The job is now done fairly well. I believe it is now time to turn attention to the problem of differentiation. As I have suggested, the stakes are high, the problems are more complex than those in selection, but the benefits to both the individual and society can be great.

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# The Role of Educational Research in Educational Improvements

*Hiroshi Kida*

## Various Types of Educational Research

Educational research is an undertaking to review and improve educational practice. In one case, educational practitioners conduct research by themselves in order to review their own practices, while in another, non-practitioners undertake the research. Educational practice here will refer to the individual instructional activities of school teachers on the one hand and the organized activities or programmes of educational institutions or educational systems on the other.

Educational research can be categorized in terms of the personnel who carry out the research project. Firstly, school teachers will conduct educational research by themselves in order to improve their day-to-day practice with the view of enhancing their educational activities. Secondly, professional associations of school teachers, such as the associations of subject teachers or other associations of teachers, also undertake various research projects. Thirdly, quite frequently the school as an entity itself conducts research projects in order to upgrade its educational functions. It is widely observed in Japan, for instance, that the education administration authorities, including local boards of education, designate individual schools for carrying out experimental studies. Fourthly, the education administration authority often establishes its own machinery within its organization for research and surveys and conducts research in order to gain insights into administration policies. The authority also establishes educational research institutions in order to explore the directions for improvement and expansion of educational undertakings. Needless to say, faculties at universities also conduct research on educational theories, methodologies, materials, and other education related factors in addition to teacher training.

Educational research then is conducted by a variety of people and organs, such as individual teachers, associations of teacher, education institutions, education administration authorities, educational research institutions and universities. The purpose of undertaking educational research also varies. School teachers and educational institutions primarily conduct research in order to examine and then improve their own educational practice. Educational research institutions and university professors on the other hand may undertake research in order to study current educational policies or practices by others rather than examine their own practice. Consequently this might result in theoretical study rather than practice-oriented study.

Changes in economic circumstances, such as increasing constraints on research funding, will bring about changes in the nature of educational research conducted by universities or educational research institutions. Universities then begin to conduct practice-oriented research on their own activities. Many of the universities in the Western countries have developed research units with the purpose of improving their own instructional methods.

Educational personnel are encouraged by laws and regulations to conduct research and to enrich their expertise. In addition, the education authority is required by law to provide opportunities for in-service training for educational personnel. Perhaps because of these provisions, Japanese educationists are enthusiastic about initiating self-study, and the local boards of education and the Ministry of Education are positive in encouraging teachers' study projects with the result that there is a great deal of educational research being carried out by educationists in Japan.

In Japan, various professional associations of school teachers are found not only at local levels,

but also at regional as well as national levels. There are 210 national level research organizations of school teachers in Japan, according to the survey conducted by the National Institute for Educational Research, the national federation of educational research institutes. Quality research projects of these organizations are subsidized by national and local governments.

School-based research activities are also very prevalent. Schools designated by the education authorities conduct research and organize study meetings and seminars which are open to teachers of other schools. To quote again from the survey data collected by NIER, 11,500 research projects were conducted by elementary and secondary education institutions throughout the country in 1981, that is, one out of five schools conducted research projects in order to improve their practice. The themes of these research projects vary from curriculum organization to subject matter teaching practices, such as the teaching of the national language, mathematics, physical education, etc. Emphasis is also given to school guidance and moral education. (The number of research reports produced by educational research institutions during 1981 reached 4 to 17 reports per institution. One may note that research projects undertaken by schools exercise relatively wider influence because of the larger number of projects undertaken.)

There are more than 500 educational research institutions throughout the country established by prefectural or municipal governments. Many of them work jointly with NIER to promote research activities. Two joint studies currently undertaken by this national federation are: (a) study of achievement levels and (b) study of guidance. These are aimed at contributing toward the upgrading of achievement level and student guidance.

Educational research can be categorized into (a) theoretical studies conducted by university professors and others, (b) practice-oriented studies on instructional methods and materials mainly conducted by schools and teachers, and (c) policy-oriented studies and statistical surveys conducted by educational administration authorities. Of course, schools and teachers may undertake theoretical studies or surveys, but it needs to be noted that the differences in interest may result in differences in research features.

## Outcome of Educational Research

In many cases, educational research is undertaken when the initiator recognizes debatable issues in educational practice or when the initiator realizes the need to bring about changes in education. When issues emerge or problems arise, educational research is called for; that means that the educational research tends to follow the reality. This is particularly so when the improvement and innovations in education are asked for by administrators.

Educational research is necessary as a basis for educational decision-making. Does the instructional ability of school teachers decline? Is there any problem in the courses of study? Does the school system need reform? How are the measures against school violence explored? Educational research is necessary to answer such questions.

There are very few scholars, however, to undertake educational research on an issue which may demand new policy initiatives, prior to its emergence. We may be able to discuss anticipatory research, but in actuality such research projects are very scarce. In addition, individual researchers have their own fields of speciality which are limited in scope and in nature. One may be able to initiate anticipatory research within one's own specialized field, but it may be almost impossible to expect such research on themes or issues which need a comprehensive approach for policy decision purposes.

It is therefore easily observable that whenever a problem arises, the education authority hastens to seek out already completed research outcomes on similar issues, or organizes an ad hoc committee comprising experts from various fields and requests them to conduct immediately comprehensive research. It is usual, however, for one to be unable to find completed research outcomes to meet the needs, and comprehensive research on an ad hoc basis tends to be time consuming. It is for this reason that educational research often incurs the mistrust of the education administration authority.

I believe that unless the researcher commits himself positively and with confidence to the research project, the research outcomes will be less reliable. It is difficult to expect high quality research outcomes when the researcher conducts the study passively upon the request of others. At times, the researcher tends, as a matter of course, to work on areas of his own concern and interest or to initiate research for the sake of research. As a consequence, research outcomes tend to be unrelated to educational practice, and educational research tends to be considered less effective in bringing about actual educational improvement. Sometimes, it may go to the extreme in that the educational practitioners do not pay attention to the outcome of the studies made by professional educational researchers.

In this regard, an interesting result has been revealed by a survey conducted by NIER.* A total of 2,425 teachers of elementary and lower secondary schools in Japan answered a question on what reference material they relied on most when they prepared for their teaching practice. The answer was quite clear. The highest rating was given to the teacher's guidebooks published by the textbook publishing companies. The second was an educational monthly published by a private company followed by educational broadcast programmes, professional technical books, reports and bulletins by schools and teachers, general culture books, publications by prefectural boards of education, publications of education centres and publications by the Ministry of Education. The rating was given to the educational research reports published by university faculties and academic societies.

The survey further revealed that 75% of the elementary and lower secondary school teachers tend to think that 'guiding theories of educational practice in the future will be brought about from the research and studies of practitioners'. Only 14% of the school teachers saw the theoretical studies carried out by university faculties as being able to perform this role. Research and development of univesity faculties also received less appreciation by school teachers. Half of the senior teachers criticized the educational research of universities and national research institutions for being isolated from school circumstances and for giving little suggestion for improvements of day-to-day educational practices. They asked that 'joint study and debate among school teachers be given more emphasis and value'.

These answers imply various issues, and one may mention that it is encouraging that the school teachers have confidence in their own research activities and want to develop them further. I do not agree, however, with their 'closed' attitude in limiting their research and studies to within their own circle.

Bearing this relationship between educational research and practice in mind, I would like to point out that the following considerations should be taken in order to make educational research more relevant to educational improvement:

**1.** The education authority and education practitioner should recognize more fully the characteristics of educational research.

Research activity needs time and money. It is also important to help the researcher develop positive and willing attitudes towards research projects. When one commissions a research project, one should give sufficient time for the project to be carried out. Full recognition of the value of research is crucial. Practitioners also need to have the right perspective in carrying out the implementation of educational policies and measures for the improvement of educational practice.

Educational research will be able to reveal one aspect of the whole picture, but policy decisions and educational practice involve making multi-dimensional judgement. Multi-dimensional and comprehensive research are thus needed before policy decisions can be made. It is through improvement that practitioners realize the meaning and limitation of the results of specific research projects.

**2.** Educational researchers on the other hand should recognize the problems and tasks to be solved and realize their responsibility for carrying out studies for the improvement of educational practice. They should recognize the position and role that their own research projects could play in relation to the improvement and expansion of educational undertakings in general. They should be confident about the value of research in contributing to the solution of problems through research.

The researcher in a highly specialized field who tends to view educational reality within the framework of his own speciality will, before long, be ignored. It is indisputable, of course, that the researcher should be equipped with a professional viewpoint and methodology, but at the same time the researcher should have a wider perspective in order to recognize problems and issues. Otherwise, he will be unable to participate meaningfully in joint studies or comprehensive studies which are badly needed in present day education.

**3.** Since various entities conduct educational research individually it is not rare, however, for researchers to be closed within their own narrow confines and not to know what kinds of research and practices are being undertaken elsewhere. The teacher in one school may not know what is going on in the school next to his. The science teacher may not grasp what is happening in the world of mathematics teaching on a common issue. There is ample evidence of such cases.

The finding that the studies conducted at universities and research institutions are not well utilized by school teachers suggests that these research projects are often isolated from reality, but at the

* Role of Educational Research, Project Committee on the Role of Educational Research, NIER, Tokyo, March 1984.

same time it may indicate that the research results of these institutions are not well disseminated among school teachers. In this sense, the role of the mass communication media is quite important. Innovation in disseminating research results and in circulating research information is strongly needed.

Smooth and effective circulation of research information should be attempted not only within one country but also at the international level. We attach crucial importance to the attempt of IBE and other international organizations to expand their role as an international clearing house of educational information in collaboration with individual education information centres of member countries. For Asia, information about educational research is to be found in a series of valuable volumes published by NIER in cooperation with the Unesco Regional Office for Education in Bangkok.

The following are particularly important:

Educational Research in Relation to Educational Reform in Asia and Oceania, 1979

Educational Research and Training in Asia and the Pacific, 1981

Scanning the New Horizons: Educational Research and Training in Asia and the Pacific, 1982

Research and Educational Reform: Problems and Issues, and Strategies for Resolving Them, 1983

Dissemination and Utilization of Educational Research, 1984

Broadening the Scope for Educational Research in Asia and the Pacific (to be published in September 1984)

## On Research Methods

Educational research begins with the correct recognition of the state of education; and comparison is a very important aspect of research. Educational practitioners can understand the real situation and points of improvement of their own practice by means of comparison with the practice of other practitioners. Also, in order to understand the real state of education in one country, one may compare it with the education in another. In this sense, IEA's programme of comparative research should be highly appreciated.

In the IEA's first study on mathematics achievement, Japanese students showed, as far as the mean score was concerned, a relatively high achievement level. In the second mathematics study, generally speaking, the same trend could be observed. When we compare various conditions as revealed by the study, we will be able to recognize the areas in which Japanese mathematics education needs improvement.

A comparison between the Netherlands and Japan on the results of algebra of Population A was presented at one session of the General Assembly last year. The mean of the Japanese samples was 18 and that of the Netherlands 15.4 out of a possible 30. Japanese students were higher in the mean score, but the number of classes which reached 22 or more in class mean was only four for Japan while it was 30 for the Netherlands (the number of sample classes was 220 in both cases). The high score of the Japanese samples was brought about by the fact that there was no class which did not reach 10 in class mean. This implies that the achievement level of Japanese students in mathematics is not entirely high. Total hours alloted annually to the mathematics education at lower secondary school level in Japan is 99.3 hours. In comparison with the 132.3 hours in the Netherlands and an average of 123 hours in other countries, the Japanese time allocation for mathematics education is too little and the expected achievement level is not high.

This is, however, not a phenomenon shown in the mathematics education at the first grade of lower secondary school in Japan, but to a fair extent it probably reflects the characteristics of Japanese education in general. The high mean score of Japanese students is because of the thin stratum of lower achievement level students, but it does not always show an absolute high level of achievement. In that sense, this comparison reveals the characteristics of mathematics education in Japan and this research points to the direction we have to go in the future.

The Japanese results of the second IEA Mathematics Study reveals in contrast to the first study that the current mathematics education in Japan needs to be improved. When one compares the result of the second study with that of the first study of 12 years ago, the calculation ability of Japanese students has improved, while the ability to answer sentence tests of items which requires creativity appeared to be on the decline.

In such a manner, by means of cross-cultural or longitudinal comparison one may be able to understand one's own state of affairs and identify tasks to be undertaken for improvement. The importance of

this method of comparison should be stressed. This principle is applicable to research on various issues within a society.

In order to be able to compare, one needs, in many cases, to put the quantified data in order and under specific conditions. Therefore, researchers have to develop correct research skills for the quantification of data.

It is an unavoidable fact, however, that quantification will always be accompanied by certain limitations. Researchers should understand, therefore, the meaning of quantification and be able to analyse properly the quantified data collected so that when a researcher compares quantified data, he or she should realize exactly what he or she is going to compare. Such considerations should be given not only to the case of judgement of achievement but also to the evaluation of aptitudes and behavioural characteristics of individual students.

Not a few cases refuse quantification of data. In such a case, detailed case studies will be an applicable method of research. NIER conducted last year a research project on school violence in lower secondary schools. Quantification of cases of violence may be useful for grasping certain trends of school violence, but in order to study the causes of such school violence, a method of case study to observe individual cases in detail, to analyse the circumstances and conditions, to examine the causes of violence and measures undertaken against the violence from various angles will be, perhaps, a more effective method. In our study we picked 16 cases and conducted case studies on them and examined them by problem areas. In addition, we studied historical experiences of school violence and collected views and opinions from more than one hundred professionals. In doing so we were hoping that the measures to be undertaken against school violence could be developed through a deeper understanding of individual cases and the recognition of views of the various people concerned.

Educational research for educational improvement is after all to recognize the real state of education for improvement by means of cross-cultural and longitudinal comparison, and further, by means of grasping the real situation in individual cases. From such recognition, measures and plans for improvement will emerge and be implemented. The results of this implementation should be again examined and the findings should be utilized for further improvement. In this sense, educational research should be an integration of study and practice with the attitude of action research.

## Priority of NIER's Research Projects

There are many research projects, large and small, undertaken by NIER staff members, but due to the nature of national educational research institutions it is difficult for many of them to be practice action-oriented research. The NIER's role is to examine objectively the educational undertaking and practice of educational administration authorities and school teachers and to submit the results of this examination to the practitioners for reference.

Priority is given to the following areas:

*1. Collection of basic materials to illustrate the educational history of Japan.*

It is the basic responsibility of NIER to collect and study the basic materials to illustrate historical details of education with a view to recording the educational development of this country. In 1973 we completed a hundred-year history of the modern school system in Japan.

*2. Understanding the trends of achievement levels and the collection of basic materials that will contribute to the improvement of teaching contents and methods.*

This is the most basic assignment for NIER as an educational research institution, and we shall be putting more emphasis on this in the future.

*3. Expansion of comparative study.*

For improvements in Japanese education it is important that researchers grasp the trends in educational development in other countries. It would be useful in this respect to participate in the joint study of IEA, and the programmes of Unesco and OECD.

*4. Fulfillment of NIER's role as an education information centre.*

We strive to collect not only research reports of universities and educational research institutions but also educational statistics, reports of classroom practice and other relevant reports from both within and outside the country, in order to provide the public with such information.

*5. Expansion and strengthening of research cooperation with educational research institutions and other educational bodies both in and outside Japan.*

NIER forms a national federation of 215 fellow educational research institutions in the country, and

conducts joint study projects and exchange of information. Internationally, NIER puts emphasis on close linkages with research institutions and researchers in other countries. In particular, NIER maintains close cooperative relations with educational institutions in Asia and the Pacific through the network of APEID of Unesco and other institutes.

In this manner, NIER focuses basically on theoretical studies in education, but NIER always keeps to the standpoint that the studies at NIER should contribute to the improvement and expansion of educational practices. NIER expects to contribute to the development of education in Japan through the cooperation with active, practice-oriented studies conducted by schools, teachers and local education research centres. ■

RESEARCH REPORT

# The Effects of Classroom Climate on Student Outcomes: A Replication in Two Developing Countries

*Barry J. Fraser*

**Abstract**

A strong tradition of research in developed countries has established consistent relationships between students' outcomes and their perceptions of psychosocial characteristics of the classroom learning environment. The present research provides a replication of the prior work in developed countries by using samples of students from two developing countries, namely, Indonesia and Thailand. Indonesian versions of the individualized Classroom Environment Questionnaire and the Classroom Environment Scale were responded to by 373 students in 18 Grade 8 and 9 classes in Padang, whereas a Thai version of the Learning Environment Inventory was responded to by 989 students in 31 Grade 12 classes in Bangkok or nearby provinces. Results supported the predictive validity of student perceptions in that significant relationships emerged between student outcomes and classroom climate among students in both Indonesia and Thailand.

Several recent reviews and syntheses of research into the effects of classroom psychosocial climate on student outcomes have revealed strong and consistent associations between the nature of the classroom climate and a variety of student outcome measures (Fraser, 1985). Certainly this is consistent with the theoretical positions of Moos (1979) and others who contend that the nature of human environments exert a strong influence of persons' functioning, satisfaction, achievement and productivity within that environment. But, apart from a few isolated studies, almost all research on classroom environment has been conducted in developed countries. Consequently, the present investigation makes a distinctive contribution to classroom climate research because it involved the translation into other languages of instruments previously available only in English, and used these subsequently in Indonesia and Thailand in exploring associations between classroom climate and student outcomes.

## Samples

The Indonesian sample was made up of a representative group of 373 Grade 8 and 9 students in 18 classes in Padang, the capital of West Sumatra (see Fraser, Pearse and Azmi, 1982 for further details). Each class was coeducational and approximately equal numbers of boys and girls made up the total sample. Data were collected from all students at the Grade 8 and 9 levels studying social science in the 18 classes at the nine junior high schools of the Department of Education in Padang. But, for reasons of economy, only a random half of the students from each class was included in the data analyses. The individual was used as the unit of analysis in investigating climate-outcome relationships.

The Thai sample consisted of a representative group of 989 Grade 12 students in 31 physics classes, each in a different school, in Bangkok or nearby provinces (see Chatiyanonda, 1978 for further details). These 31 schools consisted of 15 coeducational schools, eight boys' schools and eight girls' schools. In exploring associations between climate and outcome measures, the unit of statistical analysis used was the subgroup within the class formed by grouping students similar in general ability, personality and gender. This procedure produced a sample of 178 subgroups for all analyses of relationships between climate and outcome variables.

## Assessment of Classroom Climate

The study in Indonesia made use of an instrument based on a translation of the Individualized Classroom Environment Questionnaire (ICEQ) and the

Classroom Environment Scale (CES) (Fraser & Fisher, 1983). The first step in developing this Indonesian instrument was the translation of all 140 items contained in the 14 scales in the English versions of the ICEQ and CES. These translations were carried out by some Indonesians and Australians fluent in both the Indonesian and English languages, and the accuracy of these translations was checked by obtaining independent translations back into English. Item analysis techniques performed with data obtained by administering the translated scales to the sample of 373 students led to the deletion of five whole scales and to a reduction in the length of the remaining scales from ten items to seven items to optimize scale characteristics. The names of the nine scales in the Indonesian instrument are Personlization, Participation, Independence, Investigation, Differentiation, Involvement, Affiliation, Teacher Support, and Order and Organization. Each scale has a common-sense meaning. Typical items in these scales are the 'The teacher considers students' feelings' (Personalization), 'All students in the class do the same work at the same time' (Differentiation), and 'Assignments are usually clear so that everyone knows what to do' (Order and Organization). Table 1 shows that the alpha reliability coefficients for the nine classroom climate scales for the sample of 373 Indonesian students ranged from 0.56 to 0.73, suggesting that the Indonesian version of each scale possesses adequate international consistency.

The research in Thailand made use of a translated version of 10 of the scales in the Learning Environment Inventory (LEI) (Fraser & Fisher, 1983) considered to be especially salient in science classrooms. Each of the scales contains seven items of Likert-format with the four response alternatives of Strongly Agree, Agree, Disagree and Strongly Disagre. The scale names are Cohesiveness, Material Environment, Formality, Speed, Friction, Favouritism, Cliqueness, Satisfaction, Disorganization, Competitiveness and Difficulty. Typical items are 'All students know each other well' (Cohesiveness), 'Students do not have to hurry to finish their work' (Speed), and 'Certain students in the class are responsible for petty quarrels' (Friction).

The English version of the eleven LEI scales was translated into Thai and subsequently refined after application of a number of logical and empirical validation procedures. The first procedure involved having items checked independently by other experts for accuracy or translation, readability, clarity and face validity. Various suggestions were made and these were incorporated into a modified version of the scales. The second stage involved the further refinement of scales in the light of results from item analyses performed on data collected from the administration of the scales to a sample of Thai students. Table 2 shows that the alpha reliability coefficient of the Thai version of different climate scales ranged from 0.51 to 0.74 for the sample of 989 Thai students.

**TABLE 1 — SIMPLE AND MULTIPLE CORRELATIONS BETWEEN STUDENT OUTCOMES AND CLASSROOM CLIMATE FOR AN INDONESIAN SAMPLE (N = 373)**

| Scale | Number of Items | Alpha Reliability | Simple Correlation | |
|---|---|---|---|---|
| | | | Satisfaction | Anxiety |
| Personalization | 7 | 0.65 | 0.20** | -0.20** |
| Participation | 7 | 0.73 | 0.16** | -0.19** |
| Independence | 7 | 0.61 | -0.20** | 0.11* |
| Investigation | 7 | 0.64 | 0.10* | -0.14** |
| Differentiation | 7 | 0.57 | -0.13* | -0.05** |
| Involvement | 7 | 0.60 | 0.30** | -0.28** |
| Affiliation | 7 | 0.56 | 0.22** | -0.28** |
| Teacher Support | 7 | 0.57 | 0.21** | -0.25** |
| Order & Organization | 7 | 0.64 | 0.25** | -0.18** |
| Multiple Correlation | | | 0.38** | 0.38** |

* $p < 0.05$
** $p < 0.01$

**TABLE 2 — SIMPLE AND MULTIPLE CORRELATIONS BETWEEN STUDENT OUTCOMES AND CLASSROOM CLIMATE FOR A THAI SAMPLE (N = 989)**

| Scale | Number of Items | Alpha Reliability | Simple Correlation | |
|---|---|---|---|---|
| | | | Physics Learning | Enjoyment |
| Cohesiveness | 7 | 0.72 | 0.15 | 0.05 |
| Material Environment | 5 | 0.59 | -0.05 | 0.16* |
| Formality | 5 | 0.51 | 0.01 | 0.17* |
| Speed | 7 | 0.52 | -0.00 | -0.23** |
| Friction | 7 | 0.72 | -0.17* | -0.03 |
| Favouritism | 7 | 0.74 | -0.10 | -0.16* |
| Cliqueness | 6 | 0.72 | -0.13 | -0.11 |
| Satisfaction | 6 | 0.58 | 0.29** | 0.31** |
| Disorganization | 6 | 0.69 | -0.03 | -0.22** |
| Competitiveness | 7 | 0.58 | -0.23** | 0.14 |
| Multiple Correlation (after controlling for background variables) | | | 0.32** | 0.33** |

* $p < 0.05$
** $p < 0.01$

## Outcome Measures

The two student outcomes included in the Indonesian study were satisfaction and anxiety. Satisfaction was measured with an Indonesian translation of a ten-item Likert scale. The anxiety outcome was assessed with an Indonesian translation of an affect adjective checklist. For the sample of 373 Indonesian students, the alpha reliability was found to be 0.75 for the satisfaction measure and 0.67 for the anxiety scale.

The two student outcomes involved in the study in Thailand were called Physics Learning and Enjoyment of Physics and were based on a Thai translation of scales developed in Australia. Higher scores on the Physics Learning scale correspond to a belief that discovery, participation, comprehension and problem-solving are desirable in physics classes. Each scale consists of Likert-type items. The alpha reliability for the sample of 989 Thai students was found to be 0.60 for the Physics Learning scale and 0.63 for the Enjoyment of Physics scale.

## Relationship between Climate and Outcome Measures

Table 1 shows the results obtained when simple and multiple correlation analyses were performed to investigate associations between the two outcome measures and the nine climate scales for the Indonesian sample consisting of 373 individuals. Results show that 17 of the 18 simple correlations were statistically significant ($p < 0.05$). The interpretation of 14 of these significant correlations was that greater levels of a particular environment dimension were associated with greater satisfaction and less anxiety. The three exceptions were that satisfaction was lower in classes perceived as having greater Independence and Differentiation, and that anxiety was greater in classes perceived as having greater Independence.

The second type of analysis reported in Table 1 is a multiple correlation analysis involving the set of nine climate scales and performed separately for the satisfaction and anxiety outcomes. These analyses provide a more parsimonious picture of the joint influence of correlated environment dimensions on outcomes and reduces the Type 1 error rate associated with the simple correlational analysis. The multiple correlation was found to be 0.38 ($p < 0.01$) for each outcome. Inspection of the statistically significant regression weights showed that satisfaction was greater in classes perceived as having less Independence and greater Involvement, while anxiety was lower in classes perceived as having greater Differentiation, Involvement and Affiliation.

Associations betweeen classroom climate and student outcomes were investigated for the Thai sample of 178 subgroups, using the simple and multiple correlational analyses reported in Table 2. The results are based on the author's reanalysis of some

data reported by Chatiyanonda (1978). Results of the simple correlational analyses show that nine of the 20 correlations were significant ($p < 0.05$) It was found that Physics Learning scores were higher in classes perceived as having less Friction, more Satisfaction and less Competitiveness; and Enjoyment scores were higher in classes perceived as being characterized by a better Material Environment, greater Formality, less Speed, more Satisfaction and less Disorganization. The bottom row of Table 2 shows the magnitude of the multiple correlation between the set of ten climate scales and each outcome measure when several student background characteristics (e.g., general ability, personality) were controlled statistically. This multiple correlation was statistically significant ($p < 0.01$) for both outcomes. The interpretation of these findings was that more favourable attitudes to physics learning were expressed in classes perceived as having more Cohesiveness, less Friction, less Cliqueness and more Satisfaction, while greater Enjoyment of Physics was reported in classes characterized as having less Speed, more Satisfaction, less Disorganization and greater Competitiveness.

## Conclusion

An important practical outcome of this study of associations between student outcomes and the nature of the psychosocial classroom environment is that for the first time Indonesian and Thai versions of classroom environment instruments have become available for future research use. The findings replicated considerable prior research in developed countries which suggest that the nature of the classroom psychosocial climate is an important determinant of student outcomes. The international relevance of these findings is that they provide support for the predictive validity of students' classroom climate perceptions in two developing countries in which no similar research has been carried out previously.

The practical relevance of the present findings is that teachers might improve student attitudes by creating classroom climates found to be empirically linked with more favourable attitudes. For example, in these studies in Indonesia and Thailand, more favourable student attitudes were found in classes characterized by greater Order and Organization, greater Involvement, less Speed and greater Teacher Support.

It is hoped that this paper will stimulate and facilitate further work in the area of classroom climate in a wide range of countries. The literature reviews, translated instruments and methods described in this article could profitably form the basis for replicating several lines of prior classroom environment research (see Fraser, 1985). Some of these include the study of association between classroom environment and student outcomes, the use of climate instruments as a source of criteria of effectiveness in curriculum evaluation, the investigations of differences between students and teachers in their perceptions of actual and preferred classroom environment, the person-environment fit studies of whether students achieve better when in their preferred classroom environment, and the practical attempts to improve classroom by decreasing discrepancies between students' actual and preferred environments. (*Note:* Further information about classroom environment research, in general, and the instruments and analyses described specifically in this paper can be requested from the author.) ■

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# The Aims of Education Restated

John White
London: Routledge and Kegan Paul, 1982

*Reviewed by Tan Tai Wei*

The main thesis of this book is an attempt to strengthen an ethical position which White has initially given in his *Towards a Compulsory Curriculum*; and the weighing and reconciling of what, on this position, is educationally good for the individual pupil with other non-pupil-centred educational aims. A conception of the educated man emerges from the analysis, and the book ends with some indications of what has to be done in order to realize the aims.

Basically, the ethical position is that what is good for the individual is what he wants, when fully equipped personally and informationally to reflect on his desires. To uphold this, White deals, too tersely, with the usual objection to ethical naturalism. The insistence upon the is-ought distinction, to White, is merely 'a legacy from a theological age'. The reader is urged to 'begin from the other end, seeing human beings as a kind of animal, equipped like other animals with an array of possibly conflicting desires'. White claims that once this is done, 'it becomes increasingly hard to see what account of a man's well-being one *could* give except in terms of the satisfaction of his desires . . .' (p 53). This curt treatment of the opposition may yet find sympathy among fellow-empiricists of White's, as regards both religion and morality; but it will hardly convince those who do not share the empiricist metaphysics. I say 'metaphysics' deliberately; for in our secular age, it is often forgotten that views, such as that man is a mere animal with desires and his good is nothing more than a function of these, are statements implying what there is, or is not, in ultimate reality. And even if it is maintained that the ultimate metaphysical standpoints cannot be argued, but can only be assumed, White shows no awareness of this in his simplistic, sweeping characterization and dismissal of the religious view of the good within one short paragraph (p 31).

Even with religion set aside, there can be independent grounds to uphold the is-ought distinction. White ignores such grounds, being satisfied with his historic-sociological account of the origin of the distinction in religion, asking, after his terse dismissal of religion, what meaning can be left of the 'ought' as distinct from 'what is'.

The same impatience with opposite views is exhibited at an even more preliminary stage of the book. In order to quickly begin using his definition of 'education' as 'upbringing', White simply decries the worth of conceptual analyses of education, declaring: 'If there are others of a more purely theoretical, and specifically of a more lexicographical, turn of mind, I shall have to leave them at this point to their own preoccupations' (p 6). But even the stipulation that education is upbringing assumes a purportedly correct conceptual analysis of education. It may seem obviously right to White, but one of the functions of philosophy is surely to justify the obvious. And, in actual fact, there have been proffered alternative analyses of education that can detract from what White thinks is obvious. Therefore, there can be no short cut for White here.

This impatience with recent analytic philosophical treatment of educational issues is evident again in the short chapter on purported intrinsic educational aims (Chapter 2). For instance, Peters' transcendental justification of knowledge as being of ultimate educational worth is dismissed in two paragraphs (p 10), with the issues involved described as 'dead leaves'. (True, White has already dealt with this in his previous book, but even there the treatment is just as curt.) An incomprehensive selection of the objections which have been made to the thesis

is simply stated and left as valid, with Peters' own attempt at a better characterization and defence of the position totally ignored.

Peters' view may be presented thus. The life of reason and choice, that involves discrimination and understanding, is conterminous with the pursuit of truth. In so far as the extent of reason to deal with all possible contingencies may be unlimited, the involvement with truth, *inter alia* in the form of knowledge and understanding, should also be unlimited. As the involvement is a defining feature of such a life-style, the latter is committed to knowledge and understanding as an ultimate or intrinsic goal. Now, all men are committed to such a life-style, so long as they cannot escape choice and discrimination in their lives. As such, if their education is *inter alia* to initiate them into this life, it must take the promotion of knowledge, ideally in all possible depth and breath, to be among its ultimate or intrinsic aims.

It is therefore clearly premature for White to sweep Peters' thesis aside with mere sayings, such as that the man who asks a serious question is committed, at most, to valuing the specific piece of information and its understanding that the answer involves.

Indications are that White's philosophic foundations for his specific curriculum proposals are badly insecure. However, as it happens, his specific proposals, analysed and argued with greater care and in greater detail may obviously be validated on other grounds. The positive and more substantial later chapters of the book are, therefore, useful, despite my above criticisms. Whatever may be the correct position as to the good for man, or as to whether knowledge can be of intrinsic educational worth, the view that education must involve, *inter alia*, equipping man with the knowledge, understanding, etc, necessary to have enlightened desires, none can deny. Whether knowledge is of intrinsic worth or not, it surely has this instrumental function in a person's education. It is also right that in curriculum construction, this 'pupil-centred' aim to equip him for autonomous life-choices must be weighed with other-regarding aims, which White question-beggingly equates with moral aims. Another legitimate aim White considers is political and economic. A blue-print for integrating these sometimes clashing aims is argued out in terms and language all can follow. Thought-provoking criticisms and recommendations are made; one or two rather radical, yet without their rationale and practicalities convincingly worked out. ■

# Studies in Classroom Interaction

Edited by Alan Chamberlain and Teodore Llamzon,
Singapore: SEAMEO Regional Language Centre, 1983

*Reviewed by Huang Shoou Ai*

This 185-page book is a compilation of ten articles by 'experienced and highly competent teachers' who attended a short course (between November 1980 and March 1981) on 'Classroom Interaction' at the SEOMEO Regional Language Centre. It is a commendable effort as it is one of the very few Singapore-based studies on some aspects of classroom interaction. Given the linguistic inclination of the Centre and possibly also in the courses it conducts, it is understandable why the accounts predominantly deal with verbal interaction.

The articles are classified into 5 sections: Teaching Strategies, Questioning Techniques, Teaching Styles, Sociocultural Factors, and Disruptive Behaviour. It is unfortunate that there is no explicit attempt to explain the differences between, say, Teaching Strategies and Teaching Styles or between Teaching Strategies and Questioning Techniques. This would enable the reader to understand and appreciate the subtle distinctions in these terms and also to understand why the articles have been classified into those sections.

All the authors take great care to analyse some teaching and learning episodes. Some are interestingly written and make rather original points. Others, however, merely reiterate points that are already common knowledge. The section on 'Language in the Classroom' in Q.E. Lim's article would be a real treat to any newcomer to Singapore classrooms. Here, the author unfolds some functions of laughter in a classroom which would normally baffle a unacquainted classroom observer; his observations display sensitivity and his analysis is insightful.

The range of subjects and school-levels reported are quite impressive for a modest volume. Subjects such as English Language (including grammar and composition), English Literature, History, Mathematics, Science and Geography are mentioned; student samples range from Primary 4 to Pre-university 2 (of those that are stated). Given this, the reader has a good range to choose from if his interest is not too specific.

The introductory chapter which attempts to give a brief overview of Singapore educational context is sadly not totally accurate. In this chapter, a skeletal description of four different approaches to classroom interaction is provided. A critique of each approach to inform its readers of the strengths and weaknesses would certainly be welcome; this would enable them to form their own judgements about the merits of each approach. However, towards the end of the book, there is a bibliography which would serve as a useful starter to anyone who wishes to venture into this area of study.

I would recommend this book to anyone who is interested in looking at how language is used in Singapore schools; within this frame, a reader can be pleasantly surprised by the detailed and systematic studies contributed by these ten teachers. It must be point out that there is another big area of classroom interaction that is deliberately, I suspect, less emphasized. Here, I refer to the non-verbal aspects of classroom interaction. Perhaps, a reader can take up this challenge. ■

# Social Crisis and Educational Research

Edited by Len Barton and Stephen Walker
London & Canberra: Croom Helm, 1984.

*Reviewed by J. Davies*

As the editors point out in the introduction, the cuts, contractions and changes in the British education system during this decade, brought about by a radical Conservative Government, can be justified or explained according to the political perspective of the respondent.

Analysis will tend to be based either on the view that such measures are part of a programme aimed at social renewal, at the establishment of an efficient, effective and economically stable society *or* on the belief that such actions form part of a project concerned with protecting privileged interests and with preserving social differentiation.

The editors believe, however, that everyone, regardless of political viewpoint, would agree that a crucial feature of current social policy in Britain is an attempt to redefine the relationship between the individual and the social formation. This, in their eyes, justifies the use of the term 'social crisis' and is the framework within which the contributions are consequently set.

The book is divided into two sections. The first of these contains papers which discuss how particular aspects of the social crisis are being experienced and dealt with in specific educational contexts. The second section brings together papers in which a major concern is the re-examination of the theoretical and methodological foundations of educational research in a time of crisis.

The papers in section one cover the effects of social and economic changes upon how teachers and pupils see school work (Buswell); the impact of changing social conditions on how teachers interpret and analyse their professional roles (Cole); the urgency social crisis gives to the development and implementation of an educational policy which takes inadequate recognition of the needs and interests of racial minorities and of how other people treat these groups (Troyna); the redefinition of the vocational function of schooling and the relationship between school and work which is being forced through the results of political change (Gleeson); and the deep ideological transformations which are exposed in an investigation of the origins and impact of the Assisted Places Scheme (Edward *et al*). The range of substantive issues dealing with the impact of the social crisis upon educational practice and policy which are discussed by the writers of these five papers in Part One give some indication of the extent and complexity of the influence and pressures the crisis promotes. Nevertheless, despite the diversity of interest there are unifying themes. The analysis of the educational effects of large-scale unemployment, particularly amongst school leavers is one such. It is forcing a redefinition of work and social relationships for everyone involved in school, undermining (Cole) teachers' authority and legitimacy claims. Teacher training and curriculum development also instance the crisis in legitimation. Furthermore, the principles upon which educational provision is related to community needs and interests are seen to be being progressively undermined or at least redefined.

The second part of the book is entitled 'Crisis in Research' three specific features of which are highlighted: the relationship between those within and those outside the research community, the methods used for conducting research, and the theoretical assumptions on which investigations and interpretations of the empirical world are based. The relationship between researchers and key government officials who commission and assess research findings is seen as alarming in the current climate. The growing attack being mounted by conservative ideologues upon social science itself coincides with a growing tendency in governmental circles to view

research as at best irrelevant and at worst malicious. Bearing in mind the interpretations and research priorities of sponsors and controlling bodies, the options available to researchers in topics and methodologies available are considerably reduced. Furthermore, changes which are taking place in schools and classrooms have consequences for relations between researcher and researched. One can no longer assume that the classroom teacher will welcome or even cooperate with the researcher unless he/she is able to demonstrate his/her awareness of the intolerable strains that many teachers are now under. The crisis is theory and method is perhaps best summarized by a quotation from Bernstein:

> The initial impression one has in reading through the literature in and about the social disciplines during the past decades or so is that of sheer chaos. Everything appears to be 'up for grabs'. There is little or no consensus — except by members of the same school or subschool — about what are the well-established results, the proper research procedures, the important problems or even the most promising theoretical approaches to the study of society and politics. There are claims and counter-claims, a virtual babble of voices demanding our attention.

Clearly no matter how carefully selected they are, no collection of papers of this nature could, or indeed should attempt to obtain a homogeneous viewpoint. Both Hammersley and West take differing approaches to the long-standing disagreements about what constitutes an appropriate *basis* for sociological analysis — the operational perspective crisis or the macro-micro debate. Both examine the assumptions which sociologists use to build their descriptions of the world, and thereby go some way towards developing a view of a coherent and internally consistent theoretical and methodological structure powerful enough to act as a basis for effective confrontation of the educational and social problems and policies which cause concern.

Finally, I must confess that although I have seen the claims for the cultural relatively of truth (Pascal's 'What is truth on one side of the Pyrenees is falsehood on the other'), very strongly attacked before, I have never read such a convincing refutation of this claim than that quoted from the philosopher W. V. Quine by Hammersley:

> Truth, says the cultural relativist, is culture-bound. But if it were then he, within his own culture, ought to see his own culture-bound truth as absolute. He cannot proclaim cultural relativism without rising above it and he cannot rise above it without giving it up.

The 'sociology of knowledge' school (e.g. Schutz, Berger, Luckmann, etc.) would no doubt counter this attack of Quine's by stating that it is not 'truth' in *philosophical* terms (i.e. *ultimate* truth) which they are concerned with but the truth or reality which has been *socially* constructed. Even so, it is as well to bear Quine's statement in mind when assessing claim and counter claim made by proponents of the 'relativity' bound sociologist. Otherwise, we get people like Sharp criticizing a long stream of authors in the sociology of education from Durkheim to Young on the grounds that they do not conform with her interpretation of Marxism. She makes little attempt, however, to substantiate her views. She merely expects her readers to accept on faith alone the validity of what she says. This approach bedevils sociology in general and the sociology of education in particular. It leads either to great uncertainty about the basic justification of the work or to theoretical (and political) dogmatism. Neither stance is acceptable.

This work at least attempts to counterbalance these tendencies and is to be commended for that. ■

# To Cypher and to Sing

Marcia P. Liu and Robert Yeo
Singapore: Federal Publications, 1984

*Reviewed by Desmond P. Pereira*

It is symptomatic of the state of the English Language in Singapore that the very timely book by Marcia Penny Liu and Robert Yeo is subtitled 'Ideas and Activities for Literature Teachers'. In any of Singapore's ASEAN neighbours, except probably the Philippines, and in most independent territories where the English Language once held sway the title would not go unchallenged. 'What literature?' would be asked. 'Literature' would refer to Malay Literature in Malaysia, Thai Literature in Thailand, Indonesian Literature in Indonesia, and, even in the Philippines, may refer to literature in Philipino, Tagalog and others of the languages spoken there.

Owing to the enormous swing to English as the medium of instruction in Singapore and the widespread use of the language in administration, business and social relations the secondary title of this book is accepted without question. Without for a moment underestimating the value of literatures in the other official languages of Singapore it may be said that recognition of the pre-eminence of Literature in English makes sense, both from the pragmatic and cultural viewpoints; and therefore the emergence of a textbook for the guidance of teachers of the subject by persons who have concerned themselves in the subject at both school and teacher-education levels is timely and gratifying. Why so? The fact implied in the book and well-known to many who have supervised or inspected teachers of English in Singapore is that there is a great deal wanting in the teaching of Literature in schools in this country. As the book clearly indicates, much of the teaching and testing of Literature in English in Singapore is on the level of comprehension. The book does not supply a reason for this state of affairs, but it is evident that at least one factor which contributed to the situation was the rationale accepted for the learning of the subject — 'study English Literature to improve your English'. While the advice was correct in itself, it implied the comparative unimportance of the other values, such as pleasure, cultural enrichment, and the sheer information obtainable from a literature of global dimensions.

Not the least of the benefits of this book is that it may, after the local teacher who is desirous of acquiring new ideas digests the material therein, spur him on to some of the very extensive additional reading on the subject of teaching the various genres of literature available in books published abroad, and recommended in the book under review. It need hardly be said that it is desirable for local teachers to study viewpoints other than those presented in the book.

Another benefit is the complementary nature of the contributions of the two writers who have collaborated in producing the book: Mr Yeo, a local teacher and teacher educator, himself an author and poet, and Mrs Liu, an expatriate teacher with experience in and a viewpoint from another country. Robert Yeo's main teaching experience has been at the tertiary level, and this may account for his rather more academic and subjective approach, whereas Penny Liu, with more experience in actual school classroom teaching, is more concerned with praticalities. Their contributions often result in mutual amelioration and reinforcement.

The learning of Literature, like that of other subjects in the curriculum, is greatly influenced by the examination-oriented school system in Singapore. There is the tendency to categorize school subjects as 'important' and 'unimportant' or 'less important', and invariably Literature suffers from this custom. There is also the effect of the highly technological and commercial society which has developed in this country, which lends prestige to scientific, technical and commercial subjects to the detriment of subjects considered merely cultural.

Fortunately, or unfortunately, the 'usefulness' of Literature in improving one's English puts it one level above the more obviously cultural subjects like music and art. These tendencies pose a challenge to the teacher of Literature in English which has not to be met by the teachers of the more 'prestigious' subjects. The only way to deal with the problem is to meet it head-on, and treat Literature not as a subject which has to compete in Singapore's pragmatic society on equal terms with Mathematics, Physics, Commerce and so forth, but as a subject which is studied for its own merits — for cultural satisfaction and aesthetic enjoyment; for the development of the breadth and depth of the mind; for the insights it brings into human nature and human relationships, with spin-offs in terms of knowledge of people, places and affairs all over the world. This objective is well brought out in *To Cypher and to Sing.* ■