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Review of Educational Research and Advances for Classroom Teachers

REACT

A Publication for Educators

Nanyang Technological University
National Institute of Education

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REACT is a publication of the National Institute of Education, Nanyang Technological University, Singapore that aims to keep student and experienced teachers, senior school personnel, principals and educational administrators abreast of recent advances in research in education. The journal, which is published bi-annually in June and December, presents summative reviews of recent research studies related to a particular area of interest, and discusses significant implications for school and classroom practice.

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Educational Baggage: The Case of Homework

Martyn Quigley

Introduction

People seem to like homework. All around the world the setting of homework is so firmly established as a central pillar of the educational world that it is rarely questioned, sometimes even by those who have to do it. Nevertheless, concerns about excessive amounts of homework and the accompanying stress arise sufficiently often that the whole question of homework and whether it is a *good thing* (as Sellar and Yeatman (1930) might have put it) needs to be reviewed from time to time. This article takes a critical look at some of the issues arising from homework: what we expect it to achieve, what does it achieve, and whether there are any harmful outcomes.

What do Stakeholders Expect from Homework?

There are several groups of people who have a keen interest in homework. Statutory bodies, individual schools, teachers and trainee teachers, parents, and of course children. We first look briefly at the expectations of these stakeholders.

Statutory Bodies

Governments and government agencies certainly seem to like homework. Table 1 shows the purposes of homework as defined by the New South Wales Department of Education and Training for public schooling in New South Wales (DET, undated) and the other, from the UK Office for Standards in Education (OFSTED, 1996) for primary schooling.

Note that both sets of statements make mention of academic benefits arising from homework, but they also include an emphasis upon personal development.

Table 1.
The purposes of homework as defined by two statutory bodies.

DET	OFSTED
Homework is valuable because it ▪ strengthens home–school links ▪ allows for practising, extending and consolidating work done in class ▪ teaches students how to plan and organize their time ▪ develops students' research skills ▪ establishes habits of study concentration and self-discipline which will serve students for the rest of their lives ▪ reaffirms the role of parents and carers as partners in education ▪ provides parents and caregivers with insights into what is being taught in the classroom and the progress of their children ▪ challenges and extends gifted and talented children	Homework can ▪ create a firm partnership between parents and children in relation to children's learning ▪ encourage parents (particularly of younger children) to spend time with their children ▪ reinforce work covered in class or help practice or consolidate basic skills and knowledge (reading, spelling, multiplication tables) ▪ encourage pupils to develop perseverance. initiative and self-discipline through independent study ▪ learn study skills and improve personal organization ▪ make pupils more responsible ▪ prepare pupils for secondary school

They seem to suggest that completing homework will develop habits of mind and character traits which will promote personal development for effective lifelong learning. It is also noteworthy that the DET list says that homework *will* achieve these most desirable goals; however, OFSTED is much more cautious and merely suggests that homework *may help* achieve these things. If homework really *does* achieve the benefits claimed for it, why do so many adults so conspicuously lack the qualities embodied in the lists?

Trainee Teachers

A group of 25 graduate Singaporean students undergoing a one year teacher training course in the teaching of secondary mathematics were asked to consider the purposes of homework. After brainstorming in small groups for about three-fourths of an hour, their responses were aggregated and are shown in Table 2. It is notable that the students generated a similar set of claims for homework as the Australian and British statutory bodies, but in addition they also generated a distinct set of purposes which, for want of a better term, are collected under the heading *pragmatic* in Table 2. These purposes are not so much positive benefits as reasons why teachers find it necessary to set homework, whether or not they wish

Table 2.
The purposes of homework as generated by a group of teacher trainees.

Academic	Personal	Pragmatic
Homework: ▪ gives pupils skill practice ▪ familiarizes pupils with examination format and range of questions ▪ gives practice in the whole range of examination past questions ▪ is necessary for formative and summative assessment ▪ encourages pupils to apply concepts ▪ is essential for revision ▪ prepares pupils for the next topic	Homework: ▪ fosters conformity ▪ fosters self-discipline ▪ develops personal responsibility ▪ gives positive reinforcement ▪ encourages pupils to take pride in their work ▪ helps pupils become critical thinkers ▪ encourages cooperative learning ▪ helps pupils develop lime management skills ▪ encourages perseverance	Homework: ▪ is school policy ▪ is expected by parents ▪ keeps pupils busy at home ▪ is a component of teacher appraisal ▪ is important for career advancement (of teachers) ▪ is demanded by the HoD ▪ keeps pupils busy in class at the end of the lesson ▪ is useful as a threat or punishment

Table 3.
Negative aspects of homework as generated by a group of teacher trainees,

Homework:
- demoralizes and depresses pupils
- imposes heavy stress on the pupils
- is actually often done by parents
- is a major cause of myopia
- steals time from the development of other desirable qualities
- is often not completed (or not completed on time) thereby generating discipline problems
- overloads teachers
- kills pupils' interest in the subject
- kills trees
- encourages rote learning
- leads to skeletal problems for some pupils

to do so. The students were adamant that the effects in the pragmatic column be considered as purposes because they were deliberately implemented.

The group of students also produced a fourth category of claims for homework and these are shown in Table **3.** With refreshing bluntness the students pointed out that their experience of school homework just a few years earlier gave them a special perspective on homework which it was important to consider.

Parents

There is little doubt that parents like homework. For instance, Hoover-Dempsey, Bassler and Burow (1995) reported that all of their sample of parents of primary age children believed that homework was a normal part of schooling and that success in school was predicated upon success with homework. Kalantzis, Gurney and Cope (1991) found that low income parents supported homework just as much as high income parents, and that there was no difference either between parents who had English as their first language and those who did not. Brown (1999) surveyed the parents at a small Islamic school in Australia. Of the 88% who responded, 97% said that children in primary school should receive homework and 80% responded that children should be given homework as soon as they started school.

Schools

It certainly appears that schools must like homework, for they seem to set an awful lot of it. However, the motives of the actual teachers who set it may not always be straightforwardly for the pupils' benefit (see Table 2). Judging by the policies on homework described by British schools in their prospectuses, schools are keen to put a positive spin on homework. For instance, consider the following list of aims published by Witton Middle School (in Worcester in the UK) shown in Table 4 (Witton Middle School, 2001).

Similarly Ilfracombe College (in Devon in the UK) publishes the following in its guide for parents:

> The College regards homework as a key part of the learning process. Regular and meaningful homework promotes achievement. It gets students into good habits, helps raise the expectations they have of themselves and encourages

Table 4.
The aims of homework of a middle school in the UK.

We believe that the role of homework should be to:
• encourage learning independent of the classroom
• reinforce/consolidate classroom activities
• develop self-discipline and time management skills
• extend and enrich classroom experiences
• involve parents and other adults in the children's education

them to share in the responsibility for their own learning. (Ilfracombe College, undated)

Notice the bold statements of the properties of homework as indisputable facts. Later we shall look a little more closely at these "facts".

Teachers

In some ways teachers should be considered separately from schools. For one thing, they are the implementers of the school's policy and what sounds very good in a policy statement may not be achievable in practice. Herold (undated) reports that one grade 3 teacher (primary 3) checks his pupils' homework daily, and pupils who turn in homework on 12 consecutive days are awarded (sic) a homework pass, allowing them to skip the next homework assignment. This is quite astonishing — if homework is so good for children, why are they rewarded by being allowed to skip it? The teacher concerned apparently reported that "... the human brain needs to use what it learns over and over to get it into long-term memory. Homework reinforces concepts learned in school and gets the information ingrained in the brain" — a statement Skinner would have been proud of. Later we will see how naïveté such as this impacts upon the actual, recordable benefits of homework.

In large surveys, such as those of Featherstone (1985)and Rogers (1992), teachers and principals reported the following list of reasons supporting the assignment of homework.

1. Homework teaches self-discipline. (Of the teachers and principals sampled in one study, 88% agreed that homework "develops children's initiative and responsibility" [Featherstone 1985, p. 6].)
2. Homework is believed to increase student achievement.
3. Homework fulfils the expectations of students, parents and the public. Teachers favour the practice by 95%, according to a recent Gallup Poll (Rogers 1992, pp. 13–15).
4. Homework increases the length of the school day without increasing the number of hours actually spent in school.
5. Homework provides an avenue of communication between the school and the parents (Kralovec and Buell, 2000, p. 35).

It is probably fair to say that the belief among teachers and principals that homework increases achievement and improves self-discipline, perseverance and

initiative is firmly established. Later on we shall examine these claims a little more closely.

Pupils

There is an astonishing dearth of material concerning pupils' views about homework. Kralovec and Buell (2000) report just one study in this area, and that consists largely of anecdotal evidence (Hinchey 1996). Not surprisingly, interviews with children who do not do their homework are not likely to provide a balanced account, and so we leave this issue for the time being, pending trustworthy research in the future.

Does Homework Achieve its Aims? What Research has to Say

The research on homework and its putative effect on achievement is notable for its inconclusiveness. Cooper (1989a, p. 28) reports that "The conclusions of past reviewers of homework show extraordinary variability. Even in regard to specific areas of application ... the reviews often directly contradict one another." This may be partly due to the complex nature of the interaction of many variables on achievement, but it is also due to some fairly questionable research methodologies, including an over-reliance on self-reporting and correlational analysis.

The best known, and most thorough, review of the effects of homework on achievement is the meta-analysis of Cooper (1989a). In this work Cooper aggregated the results of more than 100 primary sources from 11 reviews. His main finding was that

> The evidence is clear. Homework has substantial positive effects on the achievement of high school students [years 10, 11,121. Junior high students [years 8, 9, 10] also benefit from homework but only about half as much. For elementary [primary] school students the effect on homework is trivial, if it exists at all. (Cooper, 1989b, p. 89)

Primary Level

Although Cooper reported that homework has no detectable effect on achievement at the level of primary school (ages 5–12), several studies (for example Epstein, 1988) have reported that increased time spent on homework at the primary school level is actually negatively correlated with achievement. Margaret Brown of King's College, London, describing an on-going research

project on low attainment in numeracy in primary schools reported that doing regular homework does little to help children acquire numeracy ("Homework no help", 1999).

Lower Secondary Level

Increased time spent on homework is associated with higher achievement up to something less than two hours per school night. More homework than this leads to no further increase in achievement.

Upper Secondary Level

Increased time spent on homework is associated with higher achievement up to about 10 hours per week. An optimistic Cooper (1989b, p. 89) reported "... within reason, the more homework high school students do, the better their achievement." However, it is worth noting that Cooper had no data to support this claim beyond the 10 hour limit. This statement was, however, used to support political agendas calling for increased homework in schools in the US. What is often forgotten is that, even where these gains in achievement are observable, they are small compared to the gains found from classwork alone, and also small in relation to the amount of work expended by the pupils and the teachers concerned (Barber, 1986).

Post-Secondary Level

There seems to have been no research reported relating time spent on homework and levels of achievement.

Homework and Personal Development

Many claims are made for the benefits of homework as contributors to various personal qualities, such as ***to encourage pupils to develop perseverance, initiative and self-discipline through independent study*** (from Table 1, OFSTED, 1996). There does not seem to have been any significant research to substantiate this claim, or other similar claims. On the contrary, there are good reasons to suspect that homework has little, if any, relationship to the personal qualities mentioned above. For instance, what has completing a set of solutions to five quadratic equations got to do with perseverance, initiative and self-discipline? More importantly, can we find any plausible mechanism connecting the solution of quadratic equations with self-discipline? It seems unlikely.

Interestingly, some schools have homework policies which seem bluntly to contradict all reason. If homework per *se* contributes to certain personal qualities, then why should some subjects be outside its remit? For instance, Ilfracombe College has a policy which mandates that some subjects will appear on the homework timetable (mathematics, English, science, etc.) while others will not (physical education, drama, design and technology, etc.) (Ilfracombe College, undated). This example is particularly egregious for, as anyone who has completed a marathon (whether in the first 20, or outside the first 20,000) will readily testify, physical conditioning requires formidable levels of self-discipline and perseverance, and, in many cases, considerable initiative (to fit a training schedule into a busy professional life). It seems much more likely that if these qualities can be developed at all, they would be developed through physical education rather than mathematics.

Homework and Particular Subjects

There has been little research relating homework with particular subjects. Some studies suggest that homework has the greatest effects on social studies (Paschal, Weinstein and Wlaberg, 1984), while others suggest it affects mathematics the most (Austin, 1979), and others still that the subject is immaterial. It seems most likely that different types of homework will be effective in different subjects; however, empirical evidence is lacking.

Homework and Mathematics in Secondary School

The trainee teachers whose deliberations are reported in Tables 2 and 3 also produced a list of types of homework related to mathematics, and this is shown in Table 5.

Table 5.
Different types of homework encountered in mathematics

Finish off exercise started in class
Exercise not started in class (but related to the lesson in which it was set)
Exercise not started in class (but not related to the lesson in which it was set)
Extended project work
Reading to prepare for next class
IT-based work
Holiday homework
Past examination papers

This group of trainees subsequently carried out a one-week observation in secondary schools. They sat in on various mathematics lessons and made notes about, amongst other things, the type of homework which was set by the teacher. The results are illuminating. Of the 95 mathematics lessons observed, no homework was set in 32 cases. In 44 cases the homework set consisted of completing a routine exercise which was begun in class and which consisted of questions similar to those which the teacher had worked on the board as model examples. The remaining 19 homework pieces consisted of a complete exercise not started in class but also based on questions similar to those which the teacher had worked on the board as model examples. None of the other types of homework in Table 5 was observed on this occasion.

We can say therefore that in about half of the classes observed the homework consisted of the completion of an exercise consisting of skill practice or consolidation of procedures taught in the class. It is difficult to see what the pupils can learn from this type of exercise. For one thing, since the teacher taught the procedures in class and undoubtedly worked a few examples on the board, and since the pupils had the opportunity to work a few questions on their own under the expert supervision of the teacher, it seems likely that all, or at least almost all, of the learning of this procedure ***had already occurred*** before the pupils went home. The argument applies to the other case (an exercise not started in class) but perhaps not so strongly. These two types of homework also raise some other concerns. For instance, it punishes the slower pupils since it will take them longer to complete. And what happens if a child goes home with an exercise and by making a systematic error proceeds to master an erroneous algorithm? The teacher would surely detect this in class, but who is to detect it at home? A host of other related problems suggest themselves, but space does not permit their discussion here. The reader is referred to Kralovec and Buell (2000) for a detailed account.

Homework and Mathematics in Primary School

Another group of 49 primary teacher trainees kept a homework diary whilst on a teaching practice. Of the 460 homeworks set by the students during a four-week period, 303 (65.9%) were of the complete-an-exercise variety, 103 (22.4%) were whole exercises related to the lesson but not started in class, only one was an exercise designed to prepare for a coming lesson, and 53 (11.2%) were not classified.

We see that roughly two-thirds of the homework set is to practise skills and procedures taught in the relevant class. That this type of homework is so common is distinctly worrying, since the research results to date (described above) suggest the benefits to children in primary school of doing any homework at all is minimal, and since the type of homework most commonly set is at best of marginal benefit one has to wonder whether the children's time might be better spent doing something else.

Of course, some authors and commentators argue that even if homework is futile in improving academic achievement at primary level, it is still important to set homework in primary schools so that the children learn good work habits, develop self-discipline and perseverance, and so forth. Maybe so, and maybe not — little research has been done to find out. Consequently, those who do advocate homework in the primary school for such reasons need to present a mechanism to show exactly how a child who does homework does indeed develop those qualities described above.

So far we have been considering the possible benefits which various people claim for homework, and whether the reality bears out those claims. This paper has argued that those benefits, if they exist at all, are probably minor. To say that doing homework is of little, if any, benefit is one thing, but is it possible that homework is actually harmful to the children concerned? We look at this aspect next.

Homework and Health

Three distinct health risks associated with homework have emerged in recent years.

Stress

Large amounts of homework and domestic pressure to complete it have been regularly linked to high levels of stress in some children. For instance, a recent newspaper article reports that some girls in Singapore have resorted to self-mutilation as a response to high levels of stress especially related to examinations and school work ("Girls cut themselves", 2001). On occasion, some Singaporean children have resorted to suicide as a last resort ("Minister's Plea", 2000). Although Singapore's Minister of Education, Teo Chee Hean, has urged parents not to push their children too hard or to over-stress them, he admits that the pressure on children because of homework is a major problem and is likely to remain so, even though his ministry has taken steps to reduce the workload on children.

Eyesight

In May 2002, Mr. Chan Soo Sen, Minister of State for the Prime Minister's Office & Community Development and Sports of the Republic of Singapore reported that "... the two major health issues associated with our children today are not diseases but obesity and myopia." (Chan, 2002). Saw, Wu, Seet, Wong, Yap, Chia *et al.* (2001) report that educational level and academic achievement are good predictors of myopia, and suggest that these factors are most likely closely related to reading and other "near-work" activities. From their research with military conscripts in Singapore they found that the rate of myopia in new recruits rose from 26% in the 1970s to 79% in the 1990s. Further, they found that the odds of being near-sighted increased four times among personnel who had been enrolled in gifted or accelerated programmes whilst at school, and that finishing two years of pre-college courses also quadrupled the likelihood of myopia (Saw et al. 2001, p. 858). It seems that near-focusing of the eye is strongly related to the development of myopia. Homework is particularly pernicious in this respect because it involves prolonged periods of near-focusing without even the relief of switching focus from desk to blackboard as happens continuously in classrooms.

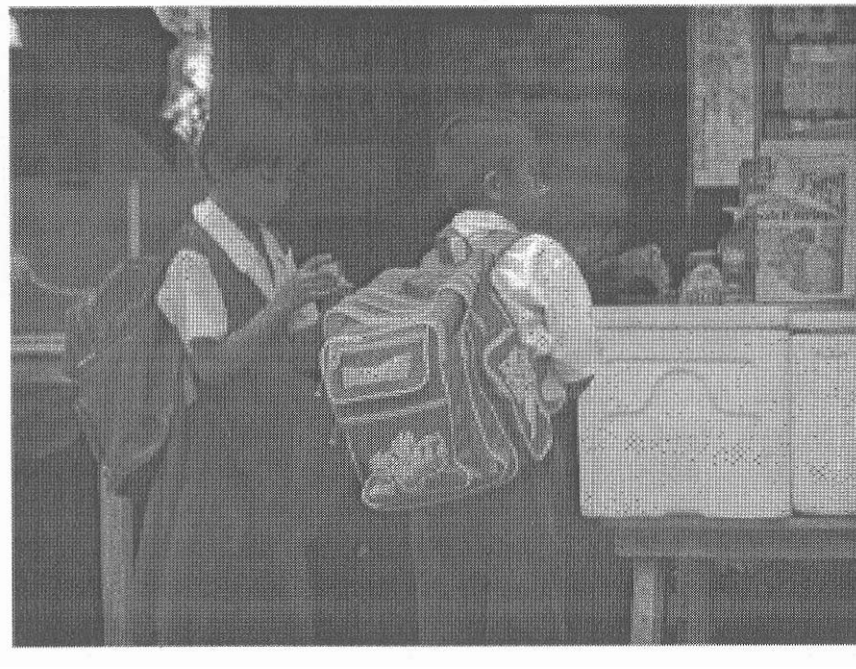

Fig. 1. School children on their way home.

Skeletal Problems

There is growing concern in many countries about potential skeletal problems arising from the practice of carrying large loads of books to and from school. The American Academy of Orthopedic Surgeons reported that thousands of American youths have back, neck and shoulder pain caused by their heavy backpacks ("A Real Pain", 1999). It is unlikely that children of other nationalities are more resistant to pain caused by heavy loads, and heavy backpacks are a common sight in many ASEAN countries. Figure 1 shows two primary school children on their way home from school in Malaysia.

Conclusion

It is difficult and perhaps unwise to draw too many conclusions from the existing research on homework. For one thing, the research corpus itself is suggestive at best and inconclusive at worst. For another, homework is, by virtue of being done at home, highly dependent on the home environment and family values. The research described above has been conducted almost exclusively in North America, Australia and .Europe, and may not reflect the ASEAN situation. Furthermore, homework is a highly emotive issue, indeed the same piece of research has sometimes been interpreted in bluntly contradictory ways to serve different political and social ends. Nevertheless there are a few conclusions which may be tentatively drawn.

(a) Most of the research on homework to date has been correlational. This means that even *if* doing more homework is correlated with higher achievement, we still cannot say whether it is the completion of homework which causes the higher achievement, or whether it is simply that higher achieving children just happen to like doing lots of homework. It could well be that some third factor (or set of factors) is driving both homework and achievement, parental expectation for instance.

(b) Even where there is evidence of achievement gains associated with homework we should keep in mind that these gains are small compared to the gains associated with classroom instruction. A consequence of this is that achievement gains are much more likely to come from increasing the length of the instructional school day than by assigning large doses of homework.

(c) All of the research suggests that homework is of little value in raising levels of achievement at primary school. Some studies even suggest that homework depresses academic achievement.

(d) Homework seems to be of some value academically in lower secondary school, but only up to about two hours per night, and the benefit is only about half that for upper secondary students.

(e) For upper secondary students and also presumably for post-secondary students, homework is of some benefit up to about 10 hours per week.

(f) Homework is often justified on the grounds that it develops personal qualities, such as self-discipline, initiative and perseverance. These claims have not been researched in any depth at all, so the claims are based on intuition, not evidence. Similarly, national, district and school policies on homework are based more on tradition and wishful thinking than on research evidence. Those who advocate the development of personal qualities through homework have yet to put forth anything approaching a plausible mechanism by which these personal qualities might emerge from doing homework.

Implications

Teachers may assign homework, broadly speaking, for one of three reasons. For any given piece of homework they should be aware of which of them applies, and should consider carefully the nature of the work which they consequently assign, perhaps something like the following.

1. *Academic:* The teacher should assign work directly related to the specific instructional objectives of the lesson to which it applies. However, since the children will be expected to learn the material *at home*, the teacher should refrain from teaching it during the lesson since this defeats the object of the homework.
2. *Personal:* If the teacher is concerned with developing personal qualities then the homework should reflect this. In the case of, say, self-discipline and perseverance, a piece of work which is extremely difficult, very long, very tedious, and which must be completed under severe time constraints will develop self-discipline and perseverance. And for maximal benefit the work should be set for the weekend, or on the eve of a major public holiday, preferably when the World Cup Final is being televised.
3. *Administrative:* If the teacher is setting homework for neither of the above reasons, but purely to satisfy the school's policy, then the homework

should be as short, pleasurable, and as interesting as possible. For instance, in mathematics the children could collect some data for authentic statistical work. Perhaps they might count the number of siblings for a demographic analysis, or maybe the number of legs on their cats to investigate the incidence of feline amputation!

Seriously, teachers should think carefully before assigning homework and should be prepared to say exactly what a piece of homework is supposed to achieve, and how it is supposed to achieve it. The worst and least justifiable reason for setting homework is that the parents expect it. No teacher should claim that.

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Education for a Future of Change: Lessons from the Past — Re-examining Progressive Education

Lachlan E. D. Crawford

Introduction

"Education for a future of change" is a key slogan liberally expounded by politicians, administrators, captains of industry and educators (see, for example, Ngiam, 2002; Shamugaratnam, 2002). It stems from the need to prepare our children for an increasingly complex world, rapid technological advances and globalization of economic markets, all of which will place new demands on the workplace and the educational system.

In a highly competitive economic world, innovation will be a key factor. The generation of new ideas and improved ways of doing things will help sharpen the competitiveness of business. Teamwork will be important as workers in teams can see more possibilities and generate more ideas than single individuals. Technological awareness and obsolescence of knowledge also mean that workers must engage in life-long learning. At the opening of the Association of Southeast Asian Institutions of Higher Learning (ASAIHL) conference in Singapore in June 2002, Professor Leo Tan, Director of the National Institute of Education, emphasized that in the new knowledge-based economy, tertiary institutions must work closely with corporate partners to update the skills of their staff throughout their period of employment (see Tan, 2002).

These demands have significant implications for education. To prepare for a future which Alvin Toffler (1970, p. 11) predicts will be characterized by a "roaring current of change", the acquisition of mere content knowledge will no longer be sufficient. The Singapore Government has realized that the traditional model of

teaching, where pupils are expected to be passive receivers of knowledge in a predominantly teacher-centred learning environment, will no longer suffice. Instead, students will need to be *active* learners, in collaborative small groups with teachers providing guidance and teaching them the skills for learning. The school environment should be more conducive towards pupil exploration and the generation of new ideas.

The Government realizes that these demands on the education system mean that changes will have to be made in many areas of the education system including the content of the curriculum, methods of teaching and learning, and methods of assessment. Perhaps it is now opportune to learn from the past and re-examine the key principles of progressive education as many of the concerns expressed today were the subject of debate, research and pedagogical practices by earlier well-known progressive educators. This article briefly reviews the historical development of progressive education and considers three major principles associated with it: education should be related to the interests of the child; learning should be active; and the teacher should act as a guide and mentor.

Review of Progressive Education

Progressive Education or *Progressivism* is a philosophy of teaching and learning which stresses egalitarianism, learning by discovery and individualism. It stems from the philosophy of Jean Jacques Rousseau (1712–1778), a Swiss-born French theorist who profoundly influenced social, political and educational ideas. In his most famous educational treatise, *Emile,* a novel written in 1762, he attacked common child-rearing practices among the wealthier French middle class parents which emphasized excessive obedience and conformity to the role of "little adults." He also deplored the exclusively verbal and literary education which many parents forced upon their children. Such doctrines and practices, he felt, ignored the child's natural interests and inclinations. One of Rousseau's major contributions to educational thought was the idea that educators should base the curriculum on the child's interests and needs rather than forcing the child to conform to a prescribed programme of learning. In some respects Rousseau, promoted the "romantic" view of child development, according to which children discover concepts and create experiences for themselves rather than deal with information given to them in a final form by adults (See William Boyd, 1962: *The Emile of Jean Jacques Rousseau).*

During the early twentieth century in America, the term "progressive education" was used by John Dewey (1916) and W.H. Kilpatrick (1934) to describe ideas and practices that aimed to make schools more effective agencies of a democratic society. Although there were many differences of style and emphasis among progressive educators, they shared the conviction that education meant *active participation* in the education process that would affect their lives. The education of actively engaged children, according to this perspective, involves two essential elements: first, respect for diversity, meaning that each individual should be recognized for his own abilities, interests, ideas, needs and cultural identity; second, the development of critical, socially engaged intelligence which enables individuals to understand and participate effectively in the affairs of their community in a collaborative effort to achieve a common goal. These elements of progressive education have been termed "child-centred" and "social reconstructivist" approaches (Dewey, 1916; Kilpatrick, 1934).

During the early twentieth century in the UK, "progressive education" was promoted by such educational theorists and practitioners as Bertrand Russell and A. S. Neill, both of whom established their own schools. The former's basic philosophy was that pupils should develop an inquiring mind and develop an individual character of vitality, knowledge, courage and sensitiveness. He proposed to do this by adapting teaching methods to each child's special ability. Russell (1926) spoke of the project method and commented on the use of practical lessons in a variety of vocations for the instruction of children. A. S. Neill, in a similar vein, established an experimental school called Summerhill in 1921. He advocated that *school should fit the child and not the child fit the school* (Neill, 1966, p. 4). He wanted to see the school promote initiative, responsibility and integrity where the ultimate goal was to produce children who were happy, well-balanced and sociable. The basic principle of the school was freedom for children to pursue their own academic interests (Neill, 1966, pp. 3–12). The school still exists today, run by his daughter Zoe, and has been the subject of intense scrutiny by academics, teachers, members of the public and, indeed, the British Government since its conception some eighty years ago. The major concern of interested observers, particularly the Government, is to ascertain whether the children at Summerhill receive an education which is sufficient for them to earn a living and be recognized as acceptable members of society.

In the 1960s and 1970s, Paul Goodman (1964), John Holt (1965) and Ivan Illich (1973) strongly criticized formal schooling with its regimentation, lack of

individualization, rigid systems of seating, grouping, grading and marking, and the authoritarian role of the teacher. They argued that schools failed to engender a zest for life, the powers of reason and imagination, the spirit of inquiry, tolerance and the enlargement of human sympathies. They were disappointed that their more child-centred ideas had not had more impact on "mainstream" schooling, due to the conservatism of many teachers and educational officials, and they took the ideas of progressive education in a more radical direction, helping give rise to the free school movement and home schooling.

These progressives campaigned vigorously, and often controversially, for new institutional structures of education that were available to all members of the public at any age and promoted the idea of "freedom" in a number of areas which are outlined below.

1. Freedom of access — the right of parents, teachers and children to work and play together on a partnership basis, to share the same facilities and participate in matters of common interest.
2. Freedom to learn in one's own time, in one's own way, i.e. without being required to attend a particular place during fixed hours and for a fixed period.
3. Freedom to establish, organize and manage schools other than those provided by the educational authorities.
4. Freedom to exploit resources for learning which are located in the community at large.

Essentially, they wanted more flexibility between courses and institutions, together with greater use of the media and resources in the community for learning. They also wanted the relationship between teachers and learners to change from the dominant/submission mode to learning through context and discovery where the teacher acts as a facilitator and a "learner among learners."

In more recent years, progressive schools have been established throughout Asia in Thailand, Taiwan, Tokyo and Hong Kong. They have been set up as an alternative to the excessive formalism of traditional education with its emphasis on strict discipline, passive learning, drills for memorization, and question and answer methods of education which have dominated pedagogical practices in Asia for centuries. More progressive thinkers point out that as Asia moves into more creative services like software design and entertainment, the traditional educational structure is out-dated. Schools now need to be encouraged to foster individualism

and produce lateral thinkers and creative students (See *Asia Magazine*, November, 1996; *Times Educational Supplement*, 11 October 2002).

In Singapore, as the Government attempts to promote creativity, flexibility and innovation among school children through such initiatives as *Thinking Schools Learning Nation*, the *IT Master Plan* and *Ability-Driven Education*, perhaps the ideas of the progressive educators discussed in this article, may strike a receptive chord in the corridors of the Ministry of Education and may be worthy of consideration, particularly as the Minister of Education, Rear Adm. Teo Chee Hean stated:

> We must encourage innovation and thinking in schools so that many different ideas and approaches can be tried at the same time. Good ideas should be shared and spread between schools and multiplied quickly *(Straits Times*, 31 July 1997).

The crucial point is that progressive ideas of education could be re-invented, built upon, transformed and adapted, where appropriate, to lay foundations for the children of the future.

There are three basic principles of progressivism: education should be related to the interests of the child; learning should be active; and the teacher should act as a guide and mentor. These three principles will be discussed in more detail in the following paragraphs.

Basic Principles of Progressivism

1. *Education Should be Related to the Interests of the Child*

The progressives argued, rather optimistically perhaps, that a child is naturally disposed to learn whatever relates to his interests or appears to solve his immediate problems. According to A.S. Neill (1966, p. 4):

> My view is that a child is innately wise and realistic. If left to himself without any adult suggestion of any kind, he will develop as far as he is capable of developing.

Thus the progressives advocated the "child-centred school in which key decisions about what will be taught, how it will be taught and how it will be assessed will be taken by the learner.

Of course, it is always a mistake to assume that learners come into the class room with a sophisticated knowledge of pedagogy, or with a natural ability to make informed choices about their own learning processes. In fact, experienced teachers realize that there are relatively few learners who are naturally endowed with the ability to make informed choices about what to learn, how to learn and how they want to be assessed. In a child-centred school, therefore, Dewey (1916) argued rather more pragmatically than A. S. Neill that the teacher does *not* hand over power, responsibility and control to the students from day one. Rather, the teacher educates learners so that they can gradually assume greater responsibility for their own learning. This may be achieved by a process of negotiation in which the views of the learner as well as the pedagogical agenda of the teacher are taken into account — a procedure of give and take. This procedure has been well documented by Nunan (1999), who incorporated the process of negotiation in teaching English as a second language to adults. His ideas, modified for primary and secondary schooling, are outlined in the following sections.

Step 1: Allow Learners to Create their Own Instructional Goals and Content

The first step in giving learners a voice in the learning process would be to allow learners to create their own instructional goals and content. An interesting and practical way of doing this is through an "action meeting" which provides an opportunity for individuals to negotiate what particular topics or projects they would like to study within the overall parameters of a particular subject. This is also a good way to facilitate group cohesion and motivation as students choose to study what they want to study (Nunan, 1999, p. 19). In science, for example, primary school children exploring the principles of flight may choose to research and construct a hot air balloon, or a kite, or a paper airplane, or a hang-glider. In social studies, pupils investigating instruments for keeping time may choose to look at the history and development of watches, or pendulum clocks, or sundials, chronometers, or water clocks.

Step 2: Help Learners Identify their Preferred Learning Styles and Strategies

The second step in the development of a learner-centred classroom is to raise awareness of different learning strategies. These may include whole-class work, pair and group work, individualized learning, cooperative learning, self-access learning and learning beyond the classroom. To assist students in their choice and to introduce this process gradually, these strategies may be introduced, first by the

teacher for all students during the course of a normal term's instruction, and then the students can make their own choices (Nunan, 1999, p. 21).

Interestingly, this approach has been implemented at two primary schools in Singapore where the teachers customize teaching methods to suit the pupils' different learning styles, temperament and abilities. For example, if children are given questions on a comprehension passage, those who learn better in groups are encouraged to sit together so that they can talk it out among themselves. Those who like a "hands-on" approach may act out the passage to the class. Meanwhile, the independent learners are left to do their work at their desks. The fast workers are then encouraged to read books from the class library or play with puzzles while their classmates complete the comprehension passage (Lee, 2002). To date, there has been no evaluation of this customized teaching and its successful contribution to the promotion of learning would obviously depend, to a large extent, on the social skills, responsible attitude, motivation and maturity of the children involved in the various activities.

Step 3: Framework to Maximize Choice of Learning Strategy

Even though pupils in a "child-centred school" may select their own instructional goals and work with their preferred learning styles, Nunan (1999, pp. 171–196), unlike A. S. Neill, advocates that they still need guidance to maximize their educational experience. This can be achieved through a framework of negotiation which includes:

(a) identifying appropriate procedures and resources for achieving the objective;
(b) setting a realistic time-frame; and
(c) identifying the means for self-evaluating the learning which has taken place.

This schedule has a number of important pedagogical advantages. In the first place it helps to focus the attention of the learner on the task to be accomplished and ensures that once the task is under way, the resources are available to complete the project. This enhances motivation. Second, a realistic time frame helps to keep the student on task without too much prevarication and ensures a sense of achievement when the task has been completed. Third, self-evaluation helps to develop the learner's self-critical faculties.

Step 4: Allow Learners to Negotiate on How They Would Like to be Assessed.

The final stage in this process of negotiation is to allow learners to negotiate how they would like to be assessed. This, of course, cannot be done in isolation from

the schools' formal agenda of *norm-referenced* term, annual and nation-wide examinations, used for the purpose of determining a student's level of performance relative to the performance of other students of a similar age and grade. However, there could be some allowance for student choice of *criterion referenced* assessment in particular subjects and at particular times of a student's academic career. In the early stages, students can be given a limited choice of assessment from a "menu" of assessment procedures. As they become more aware of their capabilities, the scope of choice could be widened.

The advantage of this approach, particularly in a Singapore educational context that values high performance, is that students tend to maximize their chances of attaining good grades as they are working in a framework of assessment which suits their talents, temperament and abilities. The argument against it, however, focuses on the difficulty of comparing the performance of students who might submit written essays with those who may opt for oral presentations or portfolios of work. The answer, of course, is that teachers do not compare students' performance with that of fellow students, but rather with specific established standards of criteria in each mode of assessment.

2. Learning Should be Active

The progressives rejected the traditional view that Iearning consists essentially of the relatively passive reception of knowledge and that knowledge itself is an abstract substance instilled by the teacher in the minds of his pupils. In contrast, they argued that the search for abstract knowledge must be translated into an *active* educational endeavour in which experience and experiment become essential components of the learning process (Dewey, 1916; Kilpatrick, 1934).

An essential characteristic of this process is the awakening of children's consciousness along a path of learning which leads from a state of passivity to a creative experience whereby students are in charge of their own educational development. The following sections examine a number of ways students can embark on an *active* educational experience.

Solving Problems of a Socially Significant Nature

One way of encouraging students to be "active" would be through solving problems of *a socially significant nature*. As soon as these socially significant problems become synonymous with the content and raw materials of the educational process, learning can no longer be seen as a transfer of crystallized knowledge.

Instead, it becomes a perpetual *grappling* with subject matter. *Grappling,* in turn, is to be understood not only as physical motion, that is in handling test tubes or counting concrete materials, or navigating with map and compass, or raising one's hand to vote, but as critical thinking, reconstruction of previously held ideas, and discovery (Dewey, **1916).**

At the secondary level, problems to be solved could include the provision of community services to the elderly; the correction of urban eyesores; the creation of anti-pollution programmes; the forming of social action groups to eliminate poverty; or the establishment of social work and hospital assistance groups. In the liberal arts, problems could include establishing a radio station, writing television scripts, creating newspapers, or launching little theatres.

A suggested format for problem solving could be:

- selection and identification of a problem which springs, in the first instance, from the students' natural curiosity to learn;
- research to discover how others have grappled with a similar problem in other contexts and at other times;
- analysis of the methods to solve problems;
- synthesis of ideas and methods to solve the problem in the local context;
- testing of ideas in discussion with peers and teachers;
- preparation of a plan, or a schedule for implementation.

To promote this approach in schools, teachers could move away from such traditional subjects as economics or geography and substitute thematic and multidisciplinary approaches to learning whereby there is a shift away from learning discrete content to learning from experiences which draw on a variety of contexts and cut across traditional boundaries within and across subject areas. Problem areas for study could then include transportation, communication and trade. In Singapore, students in the Gifted Education programme have been studying the problem of noise level in particular places to assess how it is affecting people there (Ministry of Education, Gifted Education Branch, **1998).**

The advantage of this exercise is that it engages pupils in information processing, problem solving and decision-making situations; encourages pupils to explore the inter-relationships and interconnectedness of subject-specific knowledge, use sources that go beyond textbooks, work collaboratively with their peers, think critically and creatively and communicate findings effectively.

Learners as Researchers

A second way that education can be *active* is to encourage students to become researchers. For example, it may be possible for students to embark on some simple form of ethnographic research. This calls for activities which document and explain social behaviour within groups. Ethnography explores behaviour holistically within a social setting of customs, values and styles of communication. Data sources are people, objects, environments and communication patterns inherent in the context under study (Charles and Mertler, 2002, pp. 238–261). In schools, it may be used to illustrate in some detail the conditions and interactions of individual or groups of children.

For example, primary pupils could be asked to document a typical week in the lives of five children in EM1 and five children in EM3 attending the same primary school. To give students some guidelines in the conduct of their research, they could address the following issues.

(a) What commonalities tie group members together?
(b) What seems to be the key life perspective of this group, e.g. overworked, misunderstood, superior?
(c) How do these perspectives cause the group to react, e.g. aggressively, submissively, escapist?
(d) How does the group attempt to deal with the demands made on them?
(e) What language patterns are associated with the group?
(f) What are the groups' preferred activities?
(g) What patterns of leadership, friendship, domination are noted within the group?

A major appeal of this activity is that it can construct a richly detailed picture of human life which is interesting, informative and potentially filled with implications, for example, insights into social behaviour and how greater social cohesion may be encouraged amongst pupils in the same school.

Another simple form of research to promote active learning would be descriptive research which is conducted to depict people, situations, events and conditions as they currently exist. The information obtained satisfies a desire to gain increased knowledge about the focus of interest and may frequently provide a basis for decision making. An example could be: what role does a particular school play in the life of the neighbourhood community? Other topics for

research, selected on the basis of negotiation with the teacher, could include describing the conduct of religious festivals in Singapore; investigating the use of ethnic musical instruments; tracing the history of lotus paste moon cakes; or examining the role of Singapore personnel in UN peacekeeping forces.

The major sources from which information is obtained are physical settings, records, documents, objects, materials and people directly involved. Additional information may be obtained from newspaper accounts, photographs and people who possess knowledge of the situation but are not directly involved.

Learners as Presenters

At a more challenging level, the principle of being active could lead learners to become presenters. Students could present findings from their ethnographic or descriptive research discussed above in narrative form possibly enhanced by numerical, categorical and graphic illustrations.

Assinder **(1991,** p. **228)** reports that the advantages of such an approach are that being asked to present something to members of the class gives a clear reason for the work, calls for greater responsibility to one's group and leads to increased motivation and greatly improved accuracy. Moreover, being an "expert" noticeably increases self-esteem and confidence.

3. The Teacher Should Act as a Guide and Mentor

This implies that the teacher works with the children for the attainment of mutually agreeable pedagogical ends. The progressives reject the authoritarian manners of the all-powerful teacher who is prepared to transfer packaged knowledge to "ignorant" pupils. Instead, they advocate that the teachers place their own greater knowledge and experience at the children's disposal and help them whenever they reach an impasse. Dialogue thus becomes an essential dimension in a common effort at both the understanding of reality and the acquisition of knowledge.

The teacher is vitally important in establishing the necessary framework for the process of learning, acting as a guide and coordinator and bringing forth from the class through dialogue everyone's free and conscious participation in a common effort. Romantics would say that teachers and learners would then embark as *sailors* on an educational voyage of discovery and adventure. This process is common at the postgraduate level in universities where the professor acts more as

a resource person than a dictator of studies and there is no reason why it should not be applicable for elementary and secondary students as well.

Implications

(1) To cope with a future of change, teachers and students could benefit from an appreciation and application of progressive or child-centred educational ideas to help promote the MOE's initiatives of *Thinking School Learning Nation, IT Master Plan* and *Ability-Driven Education.*

(2) To promote creativity, flexibility and innovation, education could be related where possible to the interests of the child, by allowing learners to create their own instructional goals and content, identify their preferred learning styles and strategies, and choose how they would like to be assessed, through a process of negotiation with the teacher.

(3) To encourage children to take an active role in the learning process, they could engage in problem-solving, conduct ethnographic or descriptive research and act as presenters of material to the rest of the class.

(4) To develop the independent spirit of enquiry, the teacher could act more as a guide and mentor to students rather than a distributor of knowledge.

Conclusion

Today, research scholars, educational administrators and practising teachers are re-discovering the concept of progressive education and exploring its relevance to an age of global capitalism and profound cultural change. Scholars are finding that although some of the progressives wrote over a century ago, their insights into democratic culture and meaningful education suggest helpful alternatives to the regime of standardization and mechanization that still tend to dominate our schools. In this era of significant change, there are a number of implications which can be drawn from this article for school personnel.

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Speech as a Psycholinguistic Process: The Missing Link in Oral Lessons

Christine C. M. Goh

Introduction

Speaking appears to be an easy task for some people. Words flow seamlessly as ideas are conveyed through utterances with flawless grammar. Unseen to listeners, however, are myriads of complex mental processes taking place. For fluent speakers, these processes work interactively, often automatically, and in harmony, making optimal use of the limited processing capacity of the working memory. Others, on the other hand, may experience difficulties at various levels of processing, which may be further complicated by social and linguistic issues.

This article introduces some theoretical perspectives on speech as a psycholinguistic process that take into consideration both structural and functional aspects of language. The final section will discuss implications for two common misconceptions about learner behaviour and classroom practice with regard to the teaching of oral skills.

Speech as process, particularly a psycholinguistic one, is one of the least discussed aspects of speaking. Consequently, its implications for classroom teaching are often overlooked. Teachers are familiar with speech as a "skill" and speech as a "product" because these aspects are emphasized in text books, language curricula and examinations. Examples abound in the English Language Syllabus 2001 published by the Ministry of Education, Singapore. Learning outcomes for both primary and secondary schools include such *skills* as retelling a story, describing a picture, expressing thanks and good wishes, explaining why and how something happens, giving instructions, explaining own views, initiating and sustaining conversations, and supporting opinions with reasons. Products of speech

are the various spoken text types or speech genres, which include presentations, narratives, conversations, debates, interviews and oral summaries. Speech as a product is also characterized by specific features such as discourse structure, spoken grammar (McCarthy and Carter, 1995; McCarthy, 1998), as well as phonological features, such as pronunciation, rhythm and intonation.

Considering speech as skill and product can help teachers identify lesson objectives and select learning tasks for developing learners' speaking ability. Moreover, being observable learning behaviours and outcomes, sub-skills and oral production can be readily assessed. These considerations alone, however, are insufficient for a comprehensive approach to teaching speaking in the language classroom. This is because the sub-skills and products which we hope our students can demonstrate are the result of interplay of psychological processes and other factors. This article seeks to review some current perspectives on the speech process by answering three key questions:

What is the nature of speech processing?

- What factors influence the speed of processing?
- What are the implications of the above for the language classroom?

Review of Research

The Nature of Speech Processing

> The processes of language production can be divided into those that create the skeleton of an utterance and those that flesh the skeleton out (Bock and Levelt, 1994).

The term "speech is used here to refer to any kind of oral language production ranging from that which is spontaneous, exploratory and ephemeral to the type that is drafted, edited and rehearsed (Willis, 1996). In fluent conversations, a speaker may generate two or three words per second by retrieving them from a memory store that contains tens of thousands of items (Levelt, Roelofs and Meyer, 1999). This seemingly effortless performance actually involves underlying processes that are exceedingly complex. Two areas that researchers have focused on are the nature of speech processing and factors that affect the speed of processing. Language learning researchers have also examined the effects of pre-task planning on accuracy, fluency and language complexity of oral language performance.

Processes in Speech Production

One framework for analysing the core processes is proposed by Levelt (Levelt, 1989; Levelt *et al.*, 1999) which can be broadly classified as *conceptual preparation, formulation* and *articulation.*

Conceptual preparation refers to how speakers select the topic/ content, or the notion/information to be expressed. If a topic has already been established, speakers have still to select relevant ideas which can reflect their message and communicative intention. Message selection will depend on speakers' background or "encyclopaedic" knowledge about the world. The message to be expressed may exist only vaguely, as a mental model or simple meaning components (a "gist") which have to be mapped on to specific words in the speakers' mental lexicon (Garman, 1990).

Formulation is the process by which the concepts selected are converted into language. Special considerations **are** paid to word choice and grammar. The concepts are "fleshed out" through a stringing together of words in the right order (syntax). Markers of tense, mood, number etc. have also to be indicated by selecting appropriate bound morphemes (e.g. -ed, -s, -ing). The formulated utterances are then conveyed through the activation and control of specific muscle groups of the articulatory system (consisting of vocal tract, larynx and lungs), which carries the linguistic message to the listener in the form of sound waves. This is the process of *articulation.*

These three processes of conceptual preparation, formulation and articulation are often subsumed under the term "planning". The amount of time taken for planning will depend on the type of speech to be produced. It will depend also on the context of use in which it is produced and the linguistic competence of the speaker. For example, in spontaneous interactive talk such as conversations, speakers have very little time to plan. Conceptualizing, formulating and articulating all take place at much the same time. This is when real-time speech problems such as dysfluencies are most noticeable. In contrast, longer planning time is usually available for more formal oral production such as debates and presentations. The result is that the outcome for the first may be 'messier' when compared with the latter, which is edited and rehearsed. The potential core levels or components of planning are the same nevertheless. While there is general agreement about the processes involved, there is still uncertainty about *how* these processes take place in real time. The main question is whether they take place sequentially or simultaneously.

Serialist and Connectionist Models of Processing

In the late 1950s and early 1960s information processing was presented as a number of cognitive stages which follow one another in a neat and orderly manner. This serial or linear model was severely criticized in the 1970s by researchers who derived new evidence about the interactive nature of processing, involving both top-down (knowledge/schema-driven) processes and bottom-up (data/text-driven) ones. While some experimental testing has provided new empirical support for sequential processing (Schriefers, Meyer and Levelt, 1990), the view that has gained currency is that cognitive processes are interactive and occur simultaneously through a process of spreading activation of interconnected neural networks in the brain (Dell, 1986; Rumelhart, McClelland and the PDP Research Group, 1986; Bechtel and Abrahamsen, 1991). One limitation of much of the work in computational modelling is that it focuses mainly on the word or the sentence levels, and not at the level of discourse where most speech production typically occurs. Although there is much more to be known about how the mind processes language for speech, the information that is already available still has implications for teachers and researchers involved in the areas of speaking and listening.

The Role of Monitoring

A discussion of speech processing is not complete if it focuses only on mental processes that act directly for the generation of speech. Metacognitive processes which manage and regulate these cognitive processes are equally important and are an integral part of the process of speech production. In general, every individual is able to monitor their overt speech output. We notice errors in pronunciation, grammar, dysfluencies and other problems commonly associated with speech production (Levelt, et *al.*, 1999). This is done both during and after speech production. (Some writers prefer to use the term "evaluation" when the task has been completed.) For various reasons, however, this is not always done. Speakers may also choose to ignore errors rather than make "self-repairs" to improve what they have just said.

Besides linguistic demands, speakers also have to balance pragmatic demands and be sensitive to "reciprocity conditions" (Bygate, 1988). Speaking is a reciprocal or two-way activity. In most situations, speakers are in direct contact with their listeners. This proximity allows speakers to obtain both explicit and implicit feedback on what they are saying. In other situations, such as speaking to a distant

audience via radio or television broadcasts, speakers will need to anticipate their listeners' reactions. Basic pragmatic demands include speakers' assessment of the power relationship between themselves and the listeners as well as the context in which speech is produced. In situations when speech is delivered in face-to-face interactions, monitoring is done in real-time. This may put further pressures on the cognitive processes already in operation. On the other hand, when speakers have the benefit of time and distance, monitoring may be done during preparation and rehearsal. Communicatively competent speakers not only produce utterances that are accepted by their listeners in terms of grammar, vocabulary and pronunciation, they also evaluate the appropriateness of what they say in the light of these reciprocity conditions.

Factors that Influence the Speed of Processing

A second area that researchers focus on is the factors that influence the speed of processing, which is reflected in the fluency of a person's speech. Specific features such as appropriate word choice, grammaticality, relevant and interesting content are other indications of how effectively speech is processed. Bygate (1998) outlined several matters that can influence the processes we have just described. We shall now discuss these and other issues in the light of how-they can speed up processing, or alternatively, put constraints on it.

1. *Discourse routines:* In conversations or other exchanges, speakers draw on conventionally acceptable phrases and procedures, or "routines", to initiate or end talk, negotiate or clarify meaning, take, keep or pass on a turn and manage the agenda. These routines are the result of explicit and implicit language socialization, through both formal and informal interactions an individual has experienced. For every exchange, speakers have to identify a message structure that is appropriate for the context. They also have to employ the relevant skills for specific parts of the routine. A speaker who is aware of but unfamiliar with these conceptual demands will need to spend time accessing such information from the memory store.
2. *Lexical access:* Speakers' ability to recall and select from words stored in long-term memory is another factor that influences fluency (Levelt, 1989; Levelt *et al.*, 1999). The access may be instantaneous or it may require several intermediate steps before the final desired word is recalled. At the same time, a speaker has to balance two classic aspects of language selection: syntagmatic and paradigmatic alternatives (Bygate, 1998). In the former, the speaker has to

choose words that can be strung together in logical and grammatical sequences. In the latter, the speaker needs to decide the "best" word to use out of a number of possible alternatives (e.g. whether to use *pretty, beautiful or attractive).* Speakers who have a larger store of vocabulary will thus potentially have more alternatives to choose from, but this does not necessarily enable quicker processing. Some speakers lose processing time when deliberating which word to use, and may even lose their turn (Hughes, 2002)! Using pre-fabricated "chunks" of language can also speed up processing. Chunks are formulaic phrases for specific occasions, for example, *Congrattrlations on yotrr promotion, pardon my ignorance,* and collocational units (words that usually go together), for example, *a tall order, a terrible mistake, nook and cranny,* etc.

3. *Automatization*: Cognitive processes that have been well learned become *automatized* through constant use and rehearsal (Shiffrin and Schneider, 1977). They make little or no demand on processing capacity because they do not require attention. The working memory is therefore free from one level of processing to attend more closely to the others. At the conceptualization phase, certain types of information or routines may be automatized because of the speaker's prior knowledge of facts, social or academic conventions and specific text structure. Formulation processes that can become automatic include word selection, grammar rules and pronunciation. Speakers may experience different degrees of automatization in different situations and according to differing demands made on the output. For example, when talking about a familiar topic during conversations with friends, a person might process his or her speech quickly and efficiently. The same topic, however, may require greater attention and controlled planning when it is communicated to a large audience in a formal situation.
4. *Facilitation features:* In spontaneous speech, speakers make use of a number of facilitation features to help them cope with limited processing capacity and time pressure (Bygate, 1987). They may use more co-ordination of simple clauses (e.g. joining short utterances with *and, or, because)* instead of attempting to produce long complex sentences with many clausal embeddings (e.g. combining main and subordinate clauses that make use of *whereas, when, if).* Grammar in spoken language is also simplified when speakers resort to ellipsis or omitting parts of a sentence so as to speak economically. The parts that have been omitted are contents or ideas that are readily inferred from context and the co-text. For example: *got to go, over there, if not.* They also use many fixed or formulaic expressions as fillers, for example, *What yotr've said is*

extremely interesting. These facilitation strategies are important for "buying processing time" (Hughes, 2002).

The review so far discussed the psycholinguistic processes and conditions for effective processing. In the next part of the review, we will focus on some research which has specific relevance to language learning.

The Effects of Pre-task Planning in Language Learning

Language learners experience a great deal of stress when they have to speak spontaneously. When this happens, their attention will typically be directed to conveying their meaning, which is often at the expense of accurate forms. The absence of time pressure, on the other hand, might allow learners to consider how to incorporate appropriate but difficult forms. This has important implications for language learning and several studies have sought to investigate whether allowing language learners time to plan can significantly enhance their speech production.

In a sense, it seems like a foregone conclusion that planning will improve talk. Or does it? Does pre-task planning time improve all aspects of speech? Most studies have focused on the formal aspects of language output such as fluency, sentence complexity, vocabulary range and grammatical accuracy. In other words, the focus was predominantly on the level of *formulation*. The results show that pre-task planning can give learners the opportunity to pay attention to those "problem" areas of language which they have yet to master (or "automatize") (Ellis, 1987; Skehan, 1998). It encourages them to make explicit function–form relationships (i.e. appropriate grammatical features for a specific type of communicative task). In addition, by experimenting with a greater variety of forms, learners also increase language complexity in their oral performance (Crookes, 1989), as well as improve their chances of internalizing these forms (Ellis, 1987).

In another similar study, Ortega (1999) also concluded that pre-task planning could improve language complexity and speaker fluency. Findings about grammatical accuracy were, however, inconclusive. She argued that pre-task planning may be more beneficial for higher proficiency learners. Low proficiency learners, on the other hand, have limited linguistic resources to work with, so extra planning time may not be very useful. One interesting finding is that that learners attended to form both before and *during* the oral task. In other words, the learners were not only making decisions about structure during the planning stages, they

also monitored themselves when they spoke. A small percentage of the subjects reported that they did not think pre-task planning time was helpful.

Conclusion

The apparent ease with which speech is produced belies the complex cognitive processes involved and the factors which influence it. Very often, these processes are overlooked in the classroom where attention is invariably on the final product. It is hoped that by drawing teachers' attention to speech as a psycholinguistic process, they can adopt a more balanced approach when planning lessons on speaking and listening. These can facilitate better oral performance among language learners which can have a cumulative and lasting impact on their language development as a whole.

Speech as a Psycholinguistic Process Implications

Below is a discussion of how knowledge about speech as a psycholinguistic process may help modify two common misconceptions related to the teaching of oral skills:

Misconception 1: My pupils don't speak up because they are "shy"

Not all pupils who keep quiet in their language classes are necessarily shy by nature. Some of them may want to speak up but they are unable to cope with the cognitive demands of one or all of the core processes:

- Conceptual preparation (*Don't know what to say*): This could be due to insufficient background or content knowledge, or the inability to select something that is appropriate for the task.
- Formulation (*Don't know how to put things in a "proper sentence"*): The pupil may have a notion of *what* to say, but experiences difficulty in translating that mental model into more precise language, or selecting the right word, or may not know specific key words in the target language.
- Articulation (*Don't know how to pronounce specific words in the target language*): The pupil has formulated a proposition, but may not be able to articulate it clearly. In some cases pupils may be genuinely embarrassed by their poor pronunciation.

It is worth remembering that learners may not experience the same kind of difficulties all the time. These difficulties depend greatly on the nature of the speaking task and the pupils' perceptions about different matters, for example, the degree of formality, time pressure, interest level, background knowledge, etc.

Misconception 2: Pre-task planning time always leads to better oral performance

This may be true only to a certain extent. There are, however, at least two reasons why giving learners time to prepare what they have to say will not necessarily result in greater accuracy in their oral production.

(i) First, giving learners some time to plan their summaries, presentations, and stories may allow them to improve the content, but it does not always lead to better formed sentences, greater language complexity or better delivery. Left on their own to use the planning time, some pupils may not focus on form (i.e. consider the relevant grammatical aspects necessary for the communicative task at hand). They may also ignore the need to rehearse aloud what they want to say or to check up the pronunciation of key words. In other words, unstructured or unguided planning may have little significant impact on crucial aspects of language development, such as greater accuracy in grammar and pronunciation.

(ii) Second, without teacher intervention, weaker pupils may hit the "proficiency ceiling". Pupils may be instructed to "pay attention to your grammar and pronunciation", but the weaker ones have limited linguistic knowledge to fall back on when planning and monitoring their eventual output. If left unsupported, they may not know what formal features are appropriate for a specific oral task and will not be able to spot their mistakes. In other words, they will continue to make the same mistakes even with the benefit of more time and cognitive space to plan what they have to say. On the other hand, the stronger pupils, not having to work under the pressure of time, may be able to draw on their declarative knowledge about specific aspects of language and apply it in the task.

(iii) Third, this notion of accuracy in form should not be confined to isolated grammar items alone. Formal accuracy should include macro

aspects such as text type-related grammar and discourse routines/conventions. While this connection may be immediately clear in the context of teaching writing (i.e. compositions), it is often overlooked for teaching listening and speaking. Oral tasks should therefore include the production of spoken text types that are relevant to the three areas of language use in the EL Syllabus 2001: information, interaction and literary expression/response.

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Teaching and Learning of Creativity through Jazz Improvisation

Phillip Towndrow

Introduction

> Every living, breathing human being has the potential to be creative. Each of us is a unique individual capable of creating ... it comes with the human territory. We are, simply, quite a creative species. (Creativity Web, 1999a)

There is a widespread belief that Singaporeans can secure a competitive edge in the emerging global knowledge-based economy by thinking about issues rationally, approaching problems creatively and making decisions based on sound judgment (Chua and Leong, 1997). Such is the Singapore Government's resolve to help pupils become better thinkers and learners that it is prepared to reduce regular content curriculum time by up to 30% to make way for thinking and creativity to flourish in classrooms (Ministry of Education, 1999). However, it needs to be recognized that not all people are creative to the same extent (Creativity Web, 1999b), and so the issue of how to develop and exploit the creative potential of individuals remains a challenge for educators and policy-makers alike.

Responding to the call to translate the Ministry's "Thinking Schools, Learning Nation" vision into a set of meaningful practices, Chang and Goh (2002) recently edited a "handbook" for teachers on teaching thinking skills. The final two chapters in this volume by Ng and Tan (2002), and Tan and Law (2002), address the teaching and learning of creative thinking in generic terms, but the scope of their discussions does not allow them to consider in detail the nature of creative activity in a specific domain. This review takes up that challenge by considering what cognitive psychological studies of musical composition and improvisation can tell us about the teaching and learning of creativity in both musical and non-musical

contexts. These issues are addressed primarily by looking at jazz, which has been described as an important musical genre that characterizes "... a comprehensive process [integrating] the disciplines of theory, aural musicianship, musicology and aesthetics" (Sarath, 1993, p. 23). The approach taken in this review is justified on the following grounds:

1. The study of creativity in music illustrates well many of the points raised in the general literature about the teaching and learning of creative thinking. Furthermore, the importance of creative musicianship is recognized in international curricula. For example, outcomes for the English National Curriculum, Key Stage 3 (11–14 years), state that pupils should be taught how to improvise, explore and develop musical ideas when performing (National Curriculum for England, 2002).
2. Although music is studied at both Ordinary and Advanced levels in Singapore (Ministry of Education, 2002a, b), the playing of jazz is peripheral to the mainstream examination curricula. Therefore, the focus on jazz is considered in itself a creative way of furthering our understanding of the challenges educators face by offering insights and practical strategies from a field that is relatively unexplored locally.

Review

Defining Creativity

It may come as a surprise to some to learn that defining creativity poses a problem for theorists. For example, Boden (1994, p. 75) suggests that "... the apparent unpredictability of creativity seems to outlaw any systematic explanation, whether scientific or historical". Similarly, Johnson-Laird (1993, p. 254) comments that "many people believe that creation is mysterious and magical, and that it neither can nor should be analysed presumably because the very act of defining creativity is to immediately limit it in some way". For his part, Taylor (1988) states that creative performance is a very complex multivariable phenomenon that no single variable can account for. Despite these views, the search for a "criterion of creativity" (something that predicts the potential to be creative) persists.

According to Hargreaves (1986) two main types of criteria have been used to predict creative potential: those based on the nature of creative products and those based on the characteristics of the creative people. As far as products are concerned, opinion holds that it is profitable to look at creativity in action and try to

establish what is happening. For instance, the case is often cited of Mozart who is believed to have transcribed complete compositions after they had come into his mind. The point to be made here is that if Mozart was gifted in this way, creativity might indeed be a mysterious thing (Hargreaves, 1986). However, a more practical view of creativity combines inspiration and hard work. This has led theorists to posit the existence of a series of steps that constitute a cognitive creative process.

For example, Wallas (1926) uses a four-stage theory to explain creativity in terms of a problem–solution protocol. Step one is the "preparatory" stage where information is collected that is deemed relevant to the problem at hand. Step two involves an "incubation" period where conscious attention is turned away from the problem and unconscious processes predominate. Step three or "illumination" involves the "Eureka" experience in which a specific creative solution is defined. Finally, step four, involves the "verification" or working out of the solution to the problem as identified.

Johnson-Laird (1993, pp. 255–256) claims that the creative process has some characteristic properties. First, like all mental processes, it is said to start from some given building blocks, as it is not possible to create something out of nothing. Second, the process (although it might not have a precise goal) is subject to some existing constraints or criteria that it must meet. Thus, in practice, a creator makes choices that are determined by a genre or "framework" that is in operation (Johnson-Laird, 1988, p. 207). These points can be illustrated by first looking briefly at the way composers work and then turning to the fascinating realm of jazz improvisation.

The Creative Process of Musical Composition

How Composers Work

It is difficult to get a clear picture of how composers work. However, an attempt using successive drafts of computer-based compositions has identified two main styles of composing (Folkestad, Hargreaves and Lindstrom, 1998). In the *horizontal* mode, composition and arrangement were observed as separate processes. For example, tunes were completed as a whole by composing them on an instrument and then arranging them on the computer (some improvisation was used during this phase). In contrast, the *vertical* mode involved compositions being built up of completed sections before moving on. In other words, composition and arrangement were integrated processes.

Jazz Improvisation

To the untrained ear, jazz improvisation comes across as a mass of discordant sound produced by musicians vying for attention. However, closer analysis reveals that jazz musicians carefully manipulate predetermined harmonic and rhythmic frameworks as they weave in and out of standard melodies and short musical phrases (Hinz, 1995; Sawyer, 1999). This flexibility requires a highly disciplined approach and when done well has the potential to provide an "instant line" to creativity in music (Hargreaves, Cork and Setton, 1991). This is a key point to note but surprisingly little empirical data has been collected from practising jazz improvisers to help us understand what they do and how they do it (Hargreaves, 1999).

A notable exception is the research of Hargreaves *et al.* (1991) who used a form of protocol analysis to investigate some of the cognitive processes involved in the improvisations of *novice* and *expert* jazz pianists. This study identified the playing strategies used, and the decisions made at each skill level, by a small number of participants who were invited to record right-hand "solo" improvisations over pre-recorded "backing tracks" that varied in speed and musical structure. The researchers found that either the novices had no plan in mind (apart from to keep going) or they focused on one element of the pre-recorded track and kept with that. In striking contrast, the experts had definite plans to guide their playing; either they played in a style that was consistent with the track, told a story by exploiting the "space" of the music or continued with the mood established by the backing. Further differences were noted between novices and experts in the way that they modified their plans as the music progressed. Whereas novices changed the course of their improvisations according to what they had previously done, the experts' plans were provisional in nature; they relaxed more and resorted to rehearsed "tricks" or "clichés" when they ran into difficulties.

This study of musical improvisation suggests that individuals go about the business of creating music in different ways. If it is accepted that *diversity of approach* is a key concern in musical creativity, then this will affect the extent to which the cognitive processes involved can be broken down into neat packages of analysis (Weisberg, 1993). This point of view is given greater poignancy when it is noted that there are principles that underlie improvisatory skills that are inaccessible to consciousness although some musicians may be aware of them without having "access" to them (Johnson-Laird, 1993).

Nevertheless, the ways in which artists exploit musical frameworks leads to the conclusion that creative thinking comes about as the result of *ordinary* thought

processes. If this is the case, then the way is open for (a) artistic creativity to be considered as something that can be learned and (b) the existence of thinking skills to be considered as predictors of creativity (Weisberg, 1993).

The preceding points imply that creativity is not the sole province of the gifted. Amabile (1989) supports this view with respect to children by explaining that creativity can be nurtured by providing a supportive learning environment that eschews evaluation, reward and competition in favour of providing as much flexibility as possible in the choice of activities and the way they are done. If there is a general point to be made here, then perhaps it can be illuminated by looking at how jazz improvisers learn their craft.

Learning Jazz

Musical improvisation can be learned. For instance, Sudnow (1993), a classically trained pianist, highlights a number of interesting stages in learning jazz improvisation in a self-observatory study. First, he learned to move his hands in new ways by learning the "anatomy" of left-hand jazz chords. At this stage, he acquired some smoothness in his playing from within a strict focus on rhythm. Later he was able to combine these chords with non-improvized song melodies. The next significant phase in the learning experience was to start improvising by incorporating previously taught chord-scales that were used like formulae to direct the movement of his fingers and hands. Finally, Sudnow was able to release himself from the grip of these formulaic movements and, as a result, his playing became more fluid.

It needs to be acknowledged that learning to improvise is an arduous process (Erwin, 1995; Hinz, 1995). One of the reasons for this is that it is easy to miss the point that jazz requires of those who aspire to play it a sound musical theory background and a great deal of daily practice (Madura, 1997). Take the career of jazz guitarist, John McLaughlin, as a case in point.

In an interview with Rosen (1975), McLaughlin provided some invaluable insights into how he hones his technical expertise:

> If you're willing to spend hours working, devoting and dedicating yourself to the articulation and execution, then sooner or later you're going to come through. … There are several reasons for learning scales: One, the knowledge will unlock the neck for you, you'll learn the instrument. Second, if I say I want you to improvise over Gmaj7aug5, then go to Ebaug9b5 then to Bmaj7b5 — well, if you don't know what those chords are in scale terms,

> you're lost. ... Not only do you have to know scales though, you have to know rhythm, because rhythm is of supreme importance. It's hard to say how you learn this — you can practice with a metronome or, preferably, a drummer. I used to use a cassette player and write down random sets of chords, then play them rhythmically — 6/8, 4/8, 3/8, 7/8, 5/8, 9/8, 11/8, 13/8, 21/8, anything you want. Just write out some sequences and improvise through them. Eventually you start finding chinks in your knowledge, and then some lights in the darkness.

There are several important points to surface here. McLaughlin clearly demonstrates his confidence, curiosity and willingness to confront the boundaries of his knowledge and technical competence. He also suggests that he cannot account entirely for what he does.

Discussion

Commentators have pointed to the potential of jazz improvisation to foster creativity and learning in a number of domains. Some of the educational benefits mentioned include:

- The creation of learning environments that encourage students to express their cultural identities (Sarath, 1993);
  Opportunities for freedom of expression at different levels of ability, age and experience (Erwin, 1995);
- Possible insights into the processes involved in composing music (Sarath, 1993; Erwin, 1995); and
- Collaboration in problem solving, play, theatre and story telling (Welch, 1999).

On the basis that jazz musicianship can be learned, questions arise as to how it can be taught. Referring to the United States, Tyrome (1998) notes that teaching jazz is often treated like painting by numbers. This, he claims, is done in the belief that a certain pattern of steps can lead to guaranteed results. However useful a structured approach may be, sceptics note that formulaic approaches to teaching creativity necessarily limit the extent to which it can be fostered. In addition, they advocate that jazz can only be "taught" up to a certain point and then the student musician's individuality needs to take precedence.

It is, then, at the point where conscious access to improvisatory skills ends that individuality must intervene to carry the musician forward towards expert status. Given the complexity of the issues relating to creativity mentioned so far, this

point is probably indeterminable although it may exist on a spectrum of experiences based on theoretical knowledge, practice and training. Nonetheless, the preceding points are encouraging for students who want to, or are required to, study music at school as they suggest that some skills in jazz can be learned.

If Amabile (1989) and Hargreaves *et al.* (1991) are correct, then the development and exploitation of the creative potential of individuals requires teachers to provide learning environments that support self-expression, originality and flexibility in the choice of activities and their manner of execution. This may involve teachers teaching creatively in order to provide the supportive conditions for creativity to occur (Ng and Tan, 2002) but creative teaching is not to be confused with teaching creativity. What we learn from improvisers is that formal domain expertise needs to be coupled with experiences that de-emphasize the formal aspects of teaching and learning. Acceptance of the notion that creative thinking comes about as the result of reasonable and ordinary thought processes opens the way for a consideration of the extent to which cognitive strategies can or need to be taught.

Conclusion

This review set out to explore what cognitive psychological studies of musical composition and improvisation can tell us about the teaching and learning of creativity. Creativity is a complex aspect of human behaviour that cannot easily be defined. However, progress was made by identifying steps in a cognitive creative process that help us to understand what is going on when something is created.

As far as music composition and jazz improvisation are concerned, it emerged that research study participants were able to create music by exploiting conceptual spaces to varying degrees. Support was given to the suggestion that musical creativity is subject to thinking processes that are reasonable and ordinary. This opens the way for jazz improvisation to be considered as something that can be learned. Finally, a cautionary note was sounded about teaching musical creativity through a formulaic approach. Ultimately, a point is reached where an individual's personality needs to predominate and this can probably best be achieved through a supportive, but non-intrusive learning environment that eschews excessive competition and evaluation.

Implications

- On the basis that expert and novice improvisers exploit creative spaces differently, musical creativity would seem to involve learning how to balance freedom and constraint.
- Although there are grounds to believe that problem-solving skills underpin creativity, master jazz musicians seem to have a "drive" towards constantly confronting their limitations. They also may not be able to fully explain how they learn their craft which suggests that there may still be a place for an element of mysticism to surround creative people and products.
- There seems to be a point at which cognitive creative processes are no longer open to the individual's consciousness. Any attempt, therefore, to identify the steps involved in creative thinking is likely to be incomplete and unrealizable.
- Successful creative artistes use expert domain knowledge as a foundation for their creative endeavours. One should be mindful, therefore, of the consequences of reducing core curriculum content in order to liberate classroom time for other activities.
- Attempts at making thinking explicit might well risk stumping creativity by getting everyone to "sound" the same as a result of following set procedures. Consequently, if there is anything to be learned in regular classrooms from jazz improvisers it is that diversity of approach is preferable. Students should be allowed, wherever possible, to explore conceptual spaces freely.

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Mediated Learning and Pedagogy: Applications of Feuerstein's Theory in Twenty-First Century Education

Tan Oon Seng

Introduction

Most educators are familiar with the work of Piaget and Vygotsky. Education owes a great debt to Piaget particularly for his extensive insights into the development of the mind and intelligence. Vygotsky provided educators with an understanding of how the social environment influences psychological developments.

What is less well known, but of potential interest to educators as we explore new ways to facilitate learning, is the work of Feuerstein and his theory of mediated learning experience (MLE). Reuven Feuerstein, an Israeli psychologist, began his work in the late 1940s and was at one time a student of Jean Piaget. Feuerstein's work, however, was popularized only in the 1990s. Although his work was primarily with disadvantaged adolescents and children, the theory has wider applications and can be shown to underpin contemporary classroom teaching and interventions across all sectors of education.

Feuerstein's work addressed those issues of utmost concern to parents, teachers and psychologists: What goes on in the mind of the learner? What goes on in the mind of the teacher? How can the interaction between them result in effective learning?

This article will provide (i) an outline of Feuerstein's work and his theory, (ii) explain mediated learning experience (MLE) theory, and (iii) show how it can be applied in a classroom context.

Review

Background of Feuerstein's Work and Theory

The theory of MLE was developed over the period 1950–1963 during which Feuerstein worked with large numbers of orphaned and traumatized youths coming back to Israel after the Holocaust (Feuerstein, Rand, Hoffman and Miller, 1980). These young people came from diverse cultures and disadvantaged conditions and had to be received, settled, and schooled for citizenship in a new country with a unique and thoroughly modern technological culture (Hobbs, 1980). The methods of psychometric testing used then provided little help for such a mammoth task. As Feuerstein noted, existing practice looked at children's ***failure to learn*** and not at what they could learn. Like the summative assessments of today, testing was for determining the end products of development and learning (i.e. achievement of learning outcomes) and for placement (i.e. predicting performance).

Since he was more concerned with the learning potential and untapped capacity, he turned the need to assess into a learning opportunity for the students, so that every assessment became a learning experience, interwoven with a diagnostic approach and an intervention or remediation. In this way, he made the assessment process "dynamic" and truly'developmental.

Feuerstein thought beyond the traditions of his time. When others were modifying materials for those with learning disabilities, Feuerstein chose to invest his energies in modifying these learners directly When behaviourism was looking at stimuli and output behaviours, Feuerstein chose to focus not only on the organism but the inner structure of cognition. Whilst intervention programmes were often concerned with content, Feuerstein was more concerned with the prerequisites of thinking and ways to help people learn how to learn. Psychoanalysis was concerned with emotions and antecedent factors, but Feuerstein preferred to search other mediating factors that impact future cognitive development.

At the heart of Feuerstein's Theory of Structural Cognitive Modifiability (SCM) is the belief in the plasticity and modifiability of cognition. Feuerstein (1990) argued that a person's capacity to learn is not solely determined by one's genetic endowment. Cognition can be improved or "modified irrespective of a person's age and stage of development. In SCM theory a child (or even adolescent) who has cognitive deficiencies has every chance of positive change and development through mediation.

The concept of modifiability is of prime importance in SCM. It refers not merely to remediation of specific behaviours but to changes of a "structural nature" (that is, internal changes in cognition rather than external behaviour). It is about changes that are durable, substantial and meaningful to the individual. The changes impact on the individual holistically, on dispositional traits, thinking ability and the general level of competence.

Theory of Mediated Learning Experience

How do we bring about such a structural modification of cognition? The question relates to the basis for effective intervention or interaction. Embedded in the theory of structural cognitive modifiability is the theory of *mediated* learning experience (MLE). Simply put, this states that the quality of interaction between the individual and the environment via an intentional human being (the teacher) plays a pivotal role in the cognitive development of the individual.

According to Feuerstein and Feuerstein (1991) the lack of MLE is often responsible for an individual's deficiencies in learning tools, positive disposition and propensity to learn. Without mediation, a learner has limited opportunity to benefit from either formal or informal learning.

Feuerstein and Feuerstein (1991) identifieh a list of parameters that characterize MLE. Three of these parameters are seen as indispensable to any mediated interaction: (i) intentionality and reciprocity, (ii) mediation of meaning, and (iii) transcendence.

These parameters can be viewed as a repertoire for classroom teachers, as shown in Fig. 1.

(i) Intentionality and Reciprocity (IR)

In the MLE interactionist model, the teacher not only has a clear intention of what to teach, but also shares his/her intentions to the learner. Reciprocity refers to the teacher's alertness and awareness of how the learner responds to the intention. The presence of this "IR parameter implies that an explicit and purposeful outcome results from the interaction. The "IR" parameter helps to highlight the fact that the quality of interaction is not accidental or coincidental in nature. Furthermore, it is the "IR parameter and not just the specific content to be taught that is going to determine the effectiveness of a teaching–learning situation.

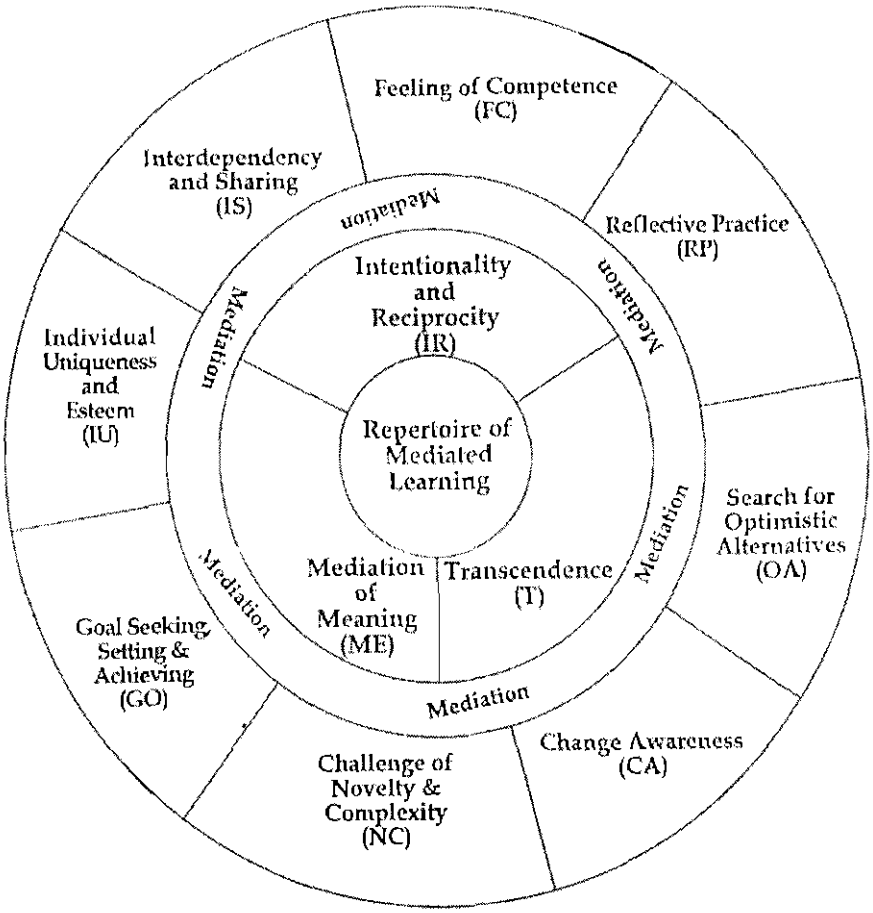

Fig. 1. Repertoire of Mediated Learning.

Source: Tan. O. S., Parsons, R. D., Hinson, S. L. & Sardo-Brown, D. (2002). *Educational Psychology: A Practitioner-Researcher Approach* (An Asian edition), p. 61. Singapore: Thomson Learning.

(ii) Mediation of Meaning (ME)

In MLE, the awareness of meaning constitutes a major component of the motivation system. Meaning involves the individual's cultural background, value system, aspirations and needs. According to Feuerstein and Feuerstein (1991), the effective mediator (teacher) *makes* **known** to the learner the significance of the interaction, for example, by asking: "Why are we learning this?" and "What is it for"?

(iii) Mediation of Transcendence (T)

According to Rand (1991) transcendence (T) is about going beyond the "here and nod' of the learning situation. It refers to the transfer of learning *across contexts*

and situations. The effective mediator enables the learner to take a life-wide approach to learning so that the learner actually learns how to learn.

Other MLE Parameters

The first three parameters (IR, ME and T) represented in the inner ring of Figure 1 are necessary and sufficient conditions for a mediated learning experience. The other parameters are often present whenever applicable in effective learning situations. The parameter on mediation of *feeling of competence* (FC) relates to the need to provide "successful experiences" for students and to remove the unwarranted fear of failure. FC is important as the fear of making mistakes often results in the student's lack of investment in time and effort to try again. The mediation of *reflective practice* (RP), which relates to self-regulatory and metacognitive behaviours, is important for classroom learning situations. RP is important for students given the demands of school life and the challenges confronting their personal and social development.

The mediation of *interdependence and sharing* (IS) parameter refers to a "sense of belonging" and sharing behaviour. For example, in the case of a small nation like Singapore, the sense of belonging is an important notion especially in relation to national education and survival (Ministry of Education, 1998). There is a need to encourage students to appreciate their being an integral part of the community and institution. Furthermore, teamwork, interdependence and knowledge sharing are attributes emphasized in today's world. The recent educational emphasis on preparing students to be more creative and entrepreneurial (Ministry of Education, 1998) makes the " G O and "NC" parameters increasingly important in the curriculum.

Application and Discussion

We shall consider an observation of pedagogy in a primary school class (Tan, Seng and Pou, in press) to illustrate how MLE principles are manifested in an effective class. By highlighting the parameters we hope to see how MLE can help teachers develop quality interaction for positive cognitive development.

The case scenario is as shown in Box 1. (For the ensuing discussion, the lesson has been broken into five "stages".)

Box 1. Classroom Scenario of MLE.

Stage 1

It is just another school day for a group of Primary Two children. There is, however, a sense of excitement and expectation amongst them as they get into the classroom. Their curiosity is aroused by the colourful charts, bright red and blue weighing machines, fruits and various objects brought in by the teacher.

Stage 2

Miss Chen, their mathematics teacher, announces to the class: "We are going to learn about the addition and subtraction of weight".

She glances at the young faces and notices a boy staring out of the window, apparently distracted by noises outside. With a firm but gentle voice Miss Chen draws the boy's attention: "Seng Lu, we are going to learn something important today."

Stage 3

She asks the class, "When you go to the market, is it important to know if the fruit seller charges you correctly when he weighs your fruits or vegetables?"

"Yes", comes the reply in chorus.

Stage 4

Miss Chen seems to have planned the learning environment well. After some recall of information and inquiry on the meaning of weight, the students are divided into groups. Each group takes turns to handle the objects and weighing machines at different stations. They have learnt that weight can be measured in grams. But what does that mean? What is 100 grams or 500 grams? As they handle the different objects and interact with Miss Chen and their peers, they discover for example that 250 grams is the weight of a real apple.

At another station they have small toy objects of smaller weights that enable them to handle addition and subtraction of small weights. They also work on various examples on a computer-simulated program later that morning.

Box 1. (*Continued*)

Stage 5

By the end of the day almost all the students had no problem completing a worksheet on the addition and subtraction of weights of various amounts. In fact, when asked to make up a story given a statement like 250 g + 200 g... they could say that Mr. Apple and Mr. Pear came together and Mr. Weighing Machine had to carry both of them who together weighed 450 grams. Another group came up with a riddle: Mr. Weight Lifter (the weighing machine) carried 2.3 kg of fruits. A pear weighs 250 g, an orange weighs 300 g and a guava weighs 400 g. How many pears, oranges and guavas were there? The teacher also gave a hint: "There is more than one answer!"

As the class ended a student remarked: "I am going with my mum to the supermarket this evening... I know what to do with the weighing machines now!"

MLE can articulate for us the key characteristics that make the interaction between Miss Chen and her students a quality interaction. Referring to the Repertoire of Mediated Learning (Fig. 1) and looking at the case scenario, it is not difficult to identify how MLE parameters apply.

Table 1 summarizes in some ways how Miss Chen's class epitomizes MLE.

At *Stage* 1 we see what was going on in the minds of the students in Miss Chen's class. The students looked forward to interacting with the teacher and their peers.

By *Stage 2* the intentions of the teacher were clearly expressed through her communication with the students and her harnessing of the environment. Her intentions were reciprocated with enthusiastic responses and resulted in encouraging learning outcomes that certainly went beyond the completion of worksheets. She not only articulated her intentions but also planned the entire learning environment to provide a range of materials and psychological tools to support learning. She ensured that the students responded to her intentions at each stage of her lesson.

Table 1.
MLE in case scenario.

Scenario	MLE parameters	Some key "observations" about the Learners and the Teacher
Stage 1	GO (Goal seeking and Achieving) IR (Intention and Reciprocity)	The Learners: There was expectation, curiosity and excitement. The Teacher: There were clear learning objectives, meticulous planning, and creative design of the learning environment.
Stage 2	IR (Intention and Reciprocity) IU (Individual Esteem)	The Learners: They received a good idea of what they would be learning. The Teacher: There was clarity of intention and she ensured that every individual was with her.
Stage 3	ME (Meaning) IR (Intention and Reciprocity)	The Learners: They could see meaning and relevance in the learning. The Teacher: There was clarity of explanation, impartation of meaning and engagement of students' attention and interest.
Stage 4	Reflective practice (RP) Challenge of novelty (NC) Interdependency and Sharing (IS)	The Learners: They were stimulated to recall, think and connect knowledge. They saw something new. They had to learn with and from others. The Teacher: She provided challenge and facilitated thinking. She provided opportunities for engaging learning in different modes thus catering to different learning styles. She gave opportunities for pair and group learning.
Stage 5	FC (Feeling of competence) Search for Alternatives (OA) Change awareness (CA) Transcendence (T)	The Learners: They were developing the sense of "now I know", "I can do it" and "I have learnt something important". The Teacher: She got the learners to feel and be competent. She presented innovative problems to demonstrate that there are alternatives and different possibilities to a solution. She empowered learners to transfer their learning to relevant situations.

At Stage 3 we see that the concept of weight was not just an abstract numerical quantity for the students. They had an idea that 250g is about the weight of a real apple. The learning was meaningful not only because the children understood the concept but also because the teacher provided meaningful contexts. All experienced teachers know that meaning is one of the most powerful motivators.

In Stages 4 and 5 the "transcendence" factor becomes apparent. Learning about weight extends beyond completing worksheets and taking tests. The principles learned extend to other lessons and to daily life. Transfer of learning is particularly important when we are addressing the individual's capacity to adapt and cope with change and new environments. For instance, students are not only acquiring specific theoretical knowledge but more importantly developing heuristics for solving a wide range of problems and applications as well as confronting problems in the real world.

It is not difficult to imagine that in such a class like Miss Chen's, the students would probably be saying to themselves things like:

"I want to be the next person to do that..."
"I am going to get the reading right..."
"I can do the addition..."
"I did it...."

In other words, the various MLE parameters are expressed in this interaction. Apart from the goal-orientations created, the students in their interactions developed a sense of confidence and a feeling that they can do it. The story lines the children created are evidence that they were challenged towards novelty and even complexity. These are the corollaries of mediated learning.

Conclusion

The theory of Feuerstein points to the importance of human mediation as the key to the psychological development of children in social interactions as well as pedagogy. Mediation is underpinned by a belief in the modifiability of the child and a holistic approach. Through the use of the MLE model teachers may be helped to re-examine their roles. MLE helps empower roles, such as being (i) facilitators of the learning of heuristics, (ii) mediators of knowledge sources (helping learners learn to access information sources, (iii) mediators of lifelong learning (helping learners develop dispositions and mindsets for learning to learn), and (iv) designers of the learning environment.

It has been said that *how* we learn is what we learn. Teachers are key mediators for empowering students to become motivated, flexible and adaptive learners for the twenty-first century.

Acknowledgements

I would like to thank Thomson Learning for the kind permission to reproduce Fig. 1 (Repertoire of Mediated Learning) in this article.

Implications of MLE for Teaching

- Every child can be helped to become a better learner and thinker. Mediation is the key to cognitive development, and the teacher's belief in the possibility of positive change and development is important.
- Education reforms are implying that teachers need to take the roles of facilitators rather than content disseminators. This can only happen if the learning environment encourages meaningfulness, feeling of competence, goal-seeking behaviours and the need for challenge and novelty.
- Purposefulness, meaningfulness and transfer of learning are indispensable elements of good pedagogy. The "Repertoire of MLE" enables teachers to focus on such factors to enhance quality interactions and key behaviours.
- MLE emphasizes the importance of teaching heuristics (i.e. strategies and reasoning in subject), scaffolding (e.g. templates for analytical thinking and systematic thinking) and connecting students to the milieu of knowledge.
- MLE encourages the use of collaborative and peer learning activities in the classroom.
- The "Repertoire of MLE" can be used as a tool for teachers to reflect on their own practices, peer review of teaching and mentoring of fellow teachers.

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Listening to Non-Western Music: Issues and Influences

Timothy Teo

Introduction

The formal study of music in most developed and developing nations is, more often than not, based on Western classical music traditions. This has contributed to an overwhelming familiarity and preference for Western music. In recent times music educators have come to believe that music of diverse cultures should be taught alongside Western music (classical or popular), that the study of various cultures and their music will broaden students' musical preferences by developing a positive value system about music and culture different from their own.

Although music education in Singapore has been dominated by Western European music traditions from the earliest years to the present, music from the other local cultures, such as Malay, Chinese, and Indian, has also been incorporated. The use of music from non-western cultures in the Singapore schools has traditionally been limited to singing and instrumental playing. To promote a greater presence of music from non-Western cultures in our schools, it is useful for educators to be aware of the issues and influences that affect students' listening preferences. In this article, I will address the factors that are known to influence students' responses to non-Western music. Implications for teaching non-Western music will also be drawn.

Review

Musical Preferences

Several studies have sought to examine young pople's preferences. May (1985) presented various Western and non-Western musical excerpts to first-, second-, and

third- grade students. The children had to indicate on a five-point non-verbal pictographic scale their preference for each excerpt. Overall, the children indicated their preference for Western excerpts over non-Western ones. May (1985) also found that preference for non-Western excerpts decreased with increasing grade levels. Older children seemed to be less tolerant of non-Western music. May also found significant differences between white and black students which suggested that music preferences are influenced by racial aspects of the musical stimuli, i.e. text, race of the performers, and various cultural associations attached to the music.

Other researchers have examined students' listening preferences for various kinds of non-Western music (Flowers, 1980; Heingartner and Hall, 1974; Shehan, 1981). Shehan (1981) had subjects respond to excerpts that were representative of Indian, African, Indonesian, Japanese, pop, and traditional Western art music (also commonly known as classical music). She got students of different grades to rate excerpts on a five-point bipolar, semantic differential scale using the following pairs of descriptors: *like–dislike,* good–bad, *interesting–uninteresting,* valuable–worthless, and buy–would *not* buy. She found that students mostly preferred Western music, pop instrumental music being the most popular, followed by traditional art music. For non-Western music students preferred, in rank-order, African, Japanese, Indian, and Indonesian excerpts.

Musical Characteristics

Researchers have sought to identify the aspects of non-Western music that listeners are most attracted to. Fung (1992) examined the relationship between a range of musical characteristics and listening preferences for traditional music from Africa, China, India, Indonesia, Japan, Korea, Middle East, and Thailand. Results showed that melody, rhythm, texture, and timbre accounted for up to 35% of the variance in preference, with "bright timbre" most preferred, while "regular rhythm" was the least preferred. In a later study, Fung (1994) found that both musicians and non-musicians alike preferred varieties of non-Western music with the following characteristics: fast, loud, *tonal* centred, varied in pitch, consonant, moderately embellished, smooth sounding, and having bright timbre.

The performing medium was another factor that influenced musical preferences. Shehan (1982) found that instrumental music was better received than vocal music, as listeners could be put off by the nasalized vocal timbres and foreign language of the lyrics. In pop music, however, vocal music was more

preferred to the instrumental version of the same piece because of the romantic subject of the lyrics (LeBlanc, 1981).

Effect of Instruction/ Familiarity

The effect of instruction on students' desire to listen to non-Western music was examined in a study by Shehan (1984) using the Indonesian gamelan as a teaching tool to sixth-graders. In this experiment, students were given information on the social and cultural aspects of the musical examples, such as musical elements, notation, geography, people, life-style, and the arts of Indonesia. Results of the study showed no significant effect on preference of teaching approach, but students who were given opportunities 'to perform on the gamelan expressed greater preferences for Indonesian music than those who did not.

Shehan (1985) also sought to find out if familiarity with a non-Western piece would influence the liking for another non-Western piece. She used twelve examples from the African, Indian, Japanese, Hispanic, pop, and Western classical styles. Results showed significant gains for all four ethnic music styles. In both studies (Shehan, 1984,19851, experimental subjects had received more exposure to non-Western music than those in the control groups. This familiarity led to a higher degree of preference for the non-Western materials used in the experiments. The finding that familiarity leads to a higher listening preference has been corroborated by other researchers (e.g. Finnas, 1989; Peery and Peery, 1986).

Intercultural Interaction

It has also been noted that students who were given greater opportunities for intercultural interaction tended to show higher preference ratings for non-Western music. Nostalgia or group dynamics, especially among subjects who were not living in their place of birth, may be important here.

In a study on the musical preferences among Chinese and Western adolescents in Hong Kong, Geisler (1990), for example, found that Chinese students demonstrated broader musical experiences by rating their own traditional music highly. In contrast, Western adolescents showed little interest in anything that did not resemble Western music in the study. Geisler suggested that, for the Chinese students, the knowledge of another culture (Western) might have led to the development of positive attitudes towards the music of that culture. Furthermore, the Chinese students, having received instruction in the English language and culture at schools, also showed a higher level of liking for Western music (classical and

pop) than the Western students showed for Chinese music, presumably because they were not schooled in the Chinese culture.

Nakazawa (1988) also noted that his Japanese subjects tended to take a stronger interest in the music and culture of their homeland after they had emigrated. It appeared that even though Japanese subjects had interacted with a different culture while living in the United States, they did not lose their Japanese culture. Rather, they appeared to become more aware of it and interested in learning about it.

Attitude Towards Cultural Diversity

Studies on the relationship between attitude towards people from different cultures and preference for non-Western music have found that, in general, a significant positive attitude correlated with musical preference (Anderson, 1992; Campbell, 1999; Norman, 1999). It was also suggested that the study of non-Western music helped to develop greater understanding, tolerance, and acceptance of people from different cultures (Fung, 1994).

Conclusion

To cater to the increasingly diverse cultures in the schools, educators have come to realize that studying the music of various cultures can broaden students' musical preferences. Students can benefit from being introduced to the characteristics of music different from the varieties they would normally choose to listen to.

A number of factors have been found to influence how students respond to non-Western music, including musical characteristics, instruction, familiarity, intercultural interaction, and attitudes towards cultural diversity.

Implications

1. *Provide information on the geographical and historical backgrounds of the non-Western music being used*

   As with other art forms, non-Western music is heavily related to its country of origin. An understanding of the history behind the selected pieces and the way non-Western music is listened to, for example, will allow

students to appreciate the cultural differences and uniqueness of the music.

2. *Choose music with special characteristics associated with various non-Western cultures*

   Certain musical conventions are culture-specific and these would facilitate teaching and learning of these cultures. Some examples are the use of instruments (e.g. *pipa* for Chinese music, *Sitar* for Indian music) and musical scales (e.g. *Pentatonic* for Chinese music, *Ragas* for Indian music).

3. *Use non-Western music to for multicultural interaction*

   Fostering positive attitudes among people of different cultures is one of the many educational aims in a multicultural society like Singapore. Owing to its cultural associations, non-Western music could be one of the most effective means of achieving intercultural interaction in an enjoyable and non-threatening way.

4. *Break away from conventional Western musical practices when teaching non-western music*

   All teachers, trained or untrained, should recognize that non-Western music is different from mainstream Western music with its special set of musical practices, elements, and theory. Students need to understand, for example, how non-Western music typically occurs in specific cultural contexts, as in times of celebration, mourning and harvest.

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PROJECT REPORT

Meeting Learning Needs of Dip. Ed. Teacher Trainees

Hairon Salleh and Lachlan Crawford

Introduction

There is a growing agreement that fundamental changes need to take place in the education of our leamers so as to prepare them with the knowledge, skills and values befitting our future society. No longer are learners expected simply to absorb information and regurgitate it in order to make the grades, but they are to be engaged in myriad forms of learning activities that enable them to construct and re-construct knowledge. It is therefore vital that we continually assess the needs of our learners and the kinds of appropriate support that might best be given. This paper examines key issues pertaining to the learning needs of 61 Year 2 Dip. Ed. (Diploma in Education) student teachers, enrolled in the NED211 module (2002) at the National Institute of Education, Singapore. The findings presented here, based on results from primary (questionnaire and document analysis) and secondary (interviews and observation) data, are outcomes of reflection-in-action and reflection-on-action processes (Schon, 1983), and use an action research cycle of "Do–Review–Learn–Apply" (Dennison and Kirk, 1990).

Background

The trainees in this study were enrolled in four tutorial groups led by the first author of this report. Prior to the tutorials, the tutor adopted a "narmw–wide–narrow" approach to learning. In this approach, learners start their learning with personal readings, followed by a topic introduction given by the tutor, small group discussions, class discussion and personal reflection (see Fig. 1). This theoretical learning model had been found to be effective when used with six tutorial groups

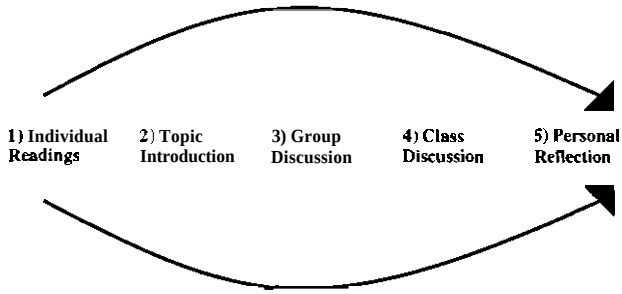

Fig. 1. "Narrow–wide–narrow" approach lo leaming

of PGDE (Post-Graduate Diploma of Education) student teachers (PED504/514 module, 2001) also tutored by the first author.

Theoretically, engagement in the reading materials at the individual level provides learners with the specific context and issues pertaining to the topic. The topic introduction presented by the tutor expands on the reading materials. The group discussion then provides the platform for the divergence of knowledge through social interactions and expression of different viewpoints. Here, learning is said to be a socially and culturally constructed activity (Vygotsky, 1962).

From the same platform, knowledge also tends to converge, as social actors begin to form patterns of similarities and differences in response to the problem-solving nature of the tutorial question/s. As groups begin to share the summary of their discussions to the whole class, this convergence heightens. The last phase involves the individual learners reflecting on the learning that has taken place and personalizing it in relation to their own knowledge and context.

Methodology

At the onset of the module, the tutor had decided to use action research as an alternative mode of evaluating student teachers' learning as it allows opportunities to address learning problems along the way rather than leaving them to after the end of the module. Moreover, it allowed for greater repetition in the induction and deduction cycles (see Fig. 2).

In total, eight action research cycles were carried out in the eight tutorial sessions. After each tutorial session, the tutor spent 30 minutes reflecting on, and documenting in note form, the tutorial session. This process involved recalling critical incidents, identifying gaps between planned targets and actual outcomes, and exploring explanations for these gaps through tutorial observations and

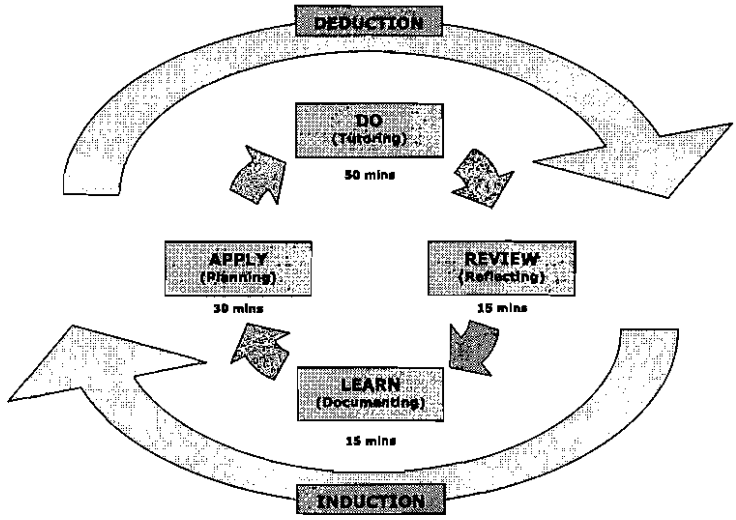

Fig. 2. Action research cycle: theoretical and practical framework

anecdotal interviews during and after tutorial sessions. Hypotheses were then generated and integrated in the planning of the subsequent lesson — thus, completing the induction phase of the action research cycle. Hypotheses generated were "put to the test" during tutorial sessions. This completed the deduction phase of the action research cycle.

At the end of the eight action research cycles, all student teachers were invited to give their evaluation of the module through a questionnaire. In total, 61 student teachers (76.3%)responded to the questionnaire, which comprised three main sections. The first section explored the *hindrances* to effective learning using the "narrow–wide–narrow" approach of learning. The second section explored student teachers' *learning needs.* The third section explored the *support* given by the tutor. In addition to the questionnaire, an analysis of the reading materials was also conducted. It is worth noting that the eight cycles of action research had provided both the impetus and content for instrument building of the questionnaire and analysis of reading materials.

Results

Three main hindrances to learning during tutorial sessions were identified. They were: (i) over-demanding reading materials; (ii) student teachers' weak reading skills; and (iii) the shortage of tutorial time. These are discussed more fully below.

The "narrow–wide–narrow" learning approach did not take off as well as expected. Student teachers came for tutorials without having read their reading materials. Initial attempts to elicit reasons for this did not provide substantial feedback. Student teachers seemed to be extremely shy at voicing out their opinions, for the following possible reasons:

1. The failure to complete the readings brought about a sense of guilt.
2. Voicing out personal opinion and feelings openly to the class could undermine their self-esteem, especially if it suggests that they were unable to complete the readings. It could suggest either laziness or incompetence, or both on their part.

Unthreatening relationships were only accomplished at the seventh tutorial when more open feedback from student teachers revealed the reasons behind their inability to complete their readings. These are elaborated below.

(i) The reading texts were overly time-demanding

Analysis of the questionnaire indicated that student teachers' poor prior reading was a result of text characteristics (73.7%), time demands (14.7%) and personal discipline (11.6%) (see Fig. 3). Long reading texts, coupled with the requirement to be able to understand and interpret academic theoretical and non-local texts, placed unrealistic time demands on the student teachers, who were concurrently dealing with the demands from seven other modules.

Interviews with trainee teachers revealed that they might have required about a week to complete one reading material because of their lack of basic

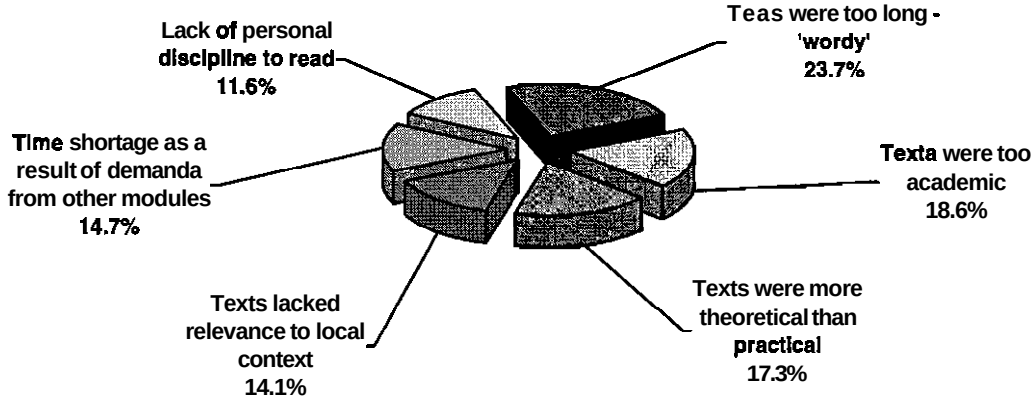

Fig. 3. Reasons for insubstantial readings (*n* = 61).

understanding of the specialized concepts and terminology pertaining to social, policy and philosophical studies, and the linguistic difficulty of the readings. Furthermore, they needed time to connect what they had read with their own experiences and local contexts.

The table below describes the required reading materials, page lengths and estimated word counts for each topic.

Topic	No. of readings	No. of pages	Est. Word count	Writing type
1. The relationship between schools		7	6426	Policy
and society/national education	2	14	7280	History
2. Efficiency to ability driven education	1	20	6882	Policy
3. Student-centred (progressive)				
education	1	12	4800	Sociology
4. Teaching and the new	2	4	1950	Sociology
professionalism		3	1440	Sociology
5. Classroom management	1	55	30,030	Sociology
6. Aims of education and the curriculum	1	24	11,250	Philosophy
7. Authority and discipline	1	24	14,040	Philosophy
8. Teaching and learning	1	13	6591	Philosophy
Total	10	176	90,689	–

(ii) The reading texts lacked relevance to student teachers' immediate practical school realities

The style of writing was more suited to academics than practitioners; the content of the readings was more theoretical than practical, and the contexts are more foreign than local (Fig. **3).** When asked how time could be maximized during tutorial sessions the questionnaire indicated that student teachers had a strong need for relevance between theory and practice (Fig. 4).

Besides being academic in nature, some reading texts are written to suit policy-makers' style of 'top-down' policy implementation. This may de-motivate student teachers from engaging in any form of critique. In addition, the lack of deep understanding of 'policy–practice' connections further undermined student teachers' motivation to read matters pertaining to policies.

(iii) Student teachers lacked the necessary reading skills

The questionnaire indicated that student teachers found the 15 minute explanation of the reading materials given by the tutor to be useful with regard to topic

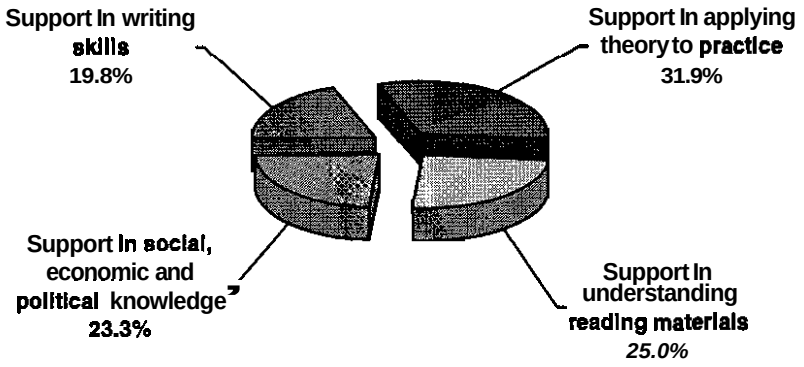

Fig. 4. Student teachers' support preference during tutorials (n= 61).

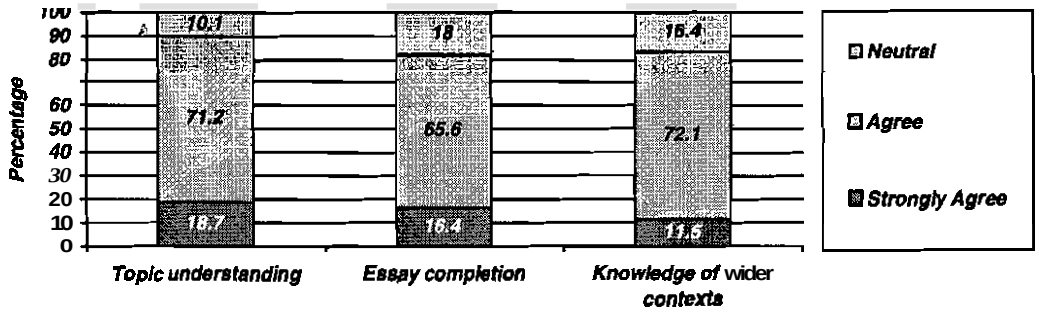

Fig. 5. Usefulness of tutor's explanation to reading materials (n = 61).

understanding, essay completion and knowledge of wider contexts (see Fig. 5). Tutor support comprised the following strategy:

(a) summarize the given readings;
(b) pin-point relevant and succinct information;
(c) demonstrate how readings could be used to support arguments in essay writing;
(d) explain acceptable referencing conventions.

(iv) Tutorial session time was too short to meet learning needs

The first two reasons suggested that a 50 minute tutorial session might not be ideal for the "narrow–wide–narrow" approach to learning to take place. The needs expressed by student teachers — clarification of reading materials (reading skills), theoretical content (social, economic and political knowledge), application of theory to practice, and assistance with writing skills (see Fig. 4) — would all require more class time.

(v) Student *teachers'* survival strategies

Interviews from student teachers, especially from the last two tutorials, revealed that as a result of time shortage they focused only on reading materials which they planned to write their essays on. This was confirmed by student teachers' reluctance to choose 'Teaching and the New Professionalism' as an essay topic because of their difficulty in dealing with an unfamiliar subject area in the limited time available. Student teachers were mainly concerned with obtaining a pass mark for the module and this took precedence over the cognitive processes of understanding the content.

On reflection, it seems the following factors could explain student teachers' reluctance to read the texts:

1. shallow grasp of the knowledge and issues for each topic;
2. poor participation in tutorial discussions;
3. lack of mastery in the knowledge base of the module;
4. low motivation to read subsequent readings;
5. a propensity towards mediocrity — aspiring 'to scrape through' the assessment;
6. low self-esteem for the module.

Applying a system thinking approach of learning, the diagram below summarizes possible processes that had been discussed so far (see Fig. 6).

Recommended Solutions

At the end of the action research cycle, a few recommendations as a response to the learning needs were made, all of which underpin the importance of support in the learning process.

1. Provide bite size reading materials. Tutors or course co-ordinators could provide markers in the reading materials to indicate degree of importance to selected texts. For example, indicating asterisks against paragraphs or stating certain pages as a 'must read'. This would motivate student teachers to read the primary texts in chewable size, and eventually the secondary texts when time allows. Another way is to provide a summary or abstract in point form for each reading material.
2. Create connections between theory and practice. Tutors or course co-ordinators could provide a glossary of taken-for-granted words in the fields of sociology, policy and philosophy at the onset of the module, and perhaps to provide

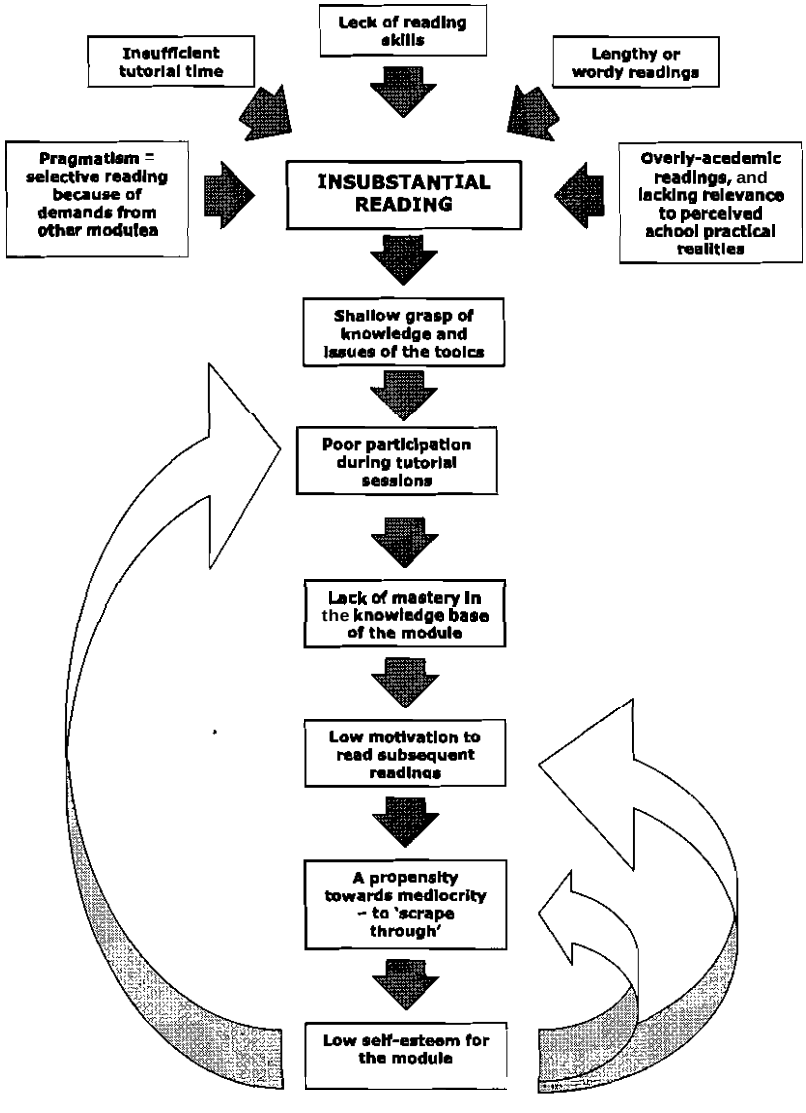

Fig. 6. Causes and effects of insubstantial readings.

time for student teachers to clarify them during the introductory tutorial. In terms of course design, case study, role-plays and simulations could be used to bring in school practical situations into the classroom. Materials used in schools could also be brought in for the same purpose. For example, record books, minutes of meetings, disciplinary report forms, parental permission forms, textbooks, workbooks and exercise books.

3. *Lengthen the time of the tutorial session to one and a half hours.* For the first three proposals to be successful, time per tutorial session needs to be expanded from 50 minutes to 1 hour and 30 minutes.

4. ***Provide resource structures to sharpen reading skills.*** Provide 10 minutes for each tutorial to dialogue on ideas and issues raised in the reading materials. Another means of support could be to provide student teachers with a written guide to effective reading where they could read at their leisure. This guide could also be uploaded to a website for easy and extensive accessibility.
5. ***Provide incentives that reward the processes of learning.*** In terms of assessment, more weight ought to be placed on application of theory to practice than on academic, written forms of assessment. For example, 60% on portfolios and 40% on individual essays. Portfolios are collections of learning resources that could be used for future professional work and development. Through portfolios, the tutor could require student teachers to engage in, and therefore be assessed on, the following:

   (a) A compilation of reading materials pertaining to the topics within the module; this is to provide the theoretical base to guide professional practice.
   (b) Reflection-on-action on previous teaching experience during contract teaching, school experience and teaching practicum; this is to promote reflective practice.
   (c) Collections of learning points gained from interactions in small group and class discussions; this is to promote collaborative practice.

In terms of individual writing, essays could favour the application of theory to practice. The following criteria, along with their respective weights, could be utilized:

(a)	Demonstration of theoretical knowledge	20%
(b)	Demonstration of practical knowledge	20%
(c)	Demonstration of application of theory to practical knowledge	50%
(d)	Organization of argument	10%
		100%

Conclusion

The obstacles to learning and the recommended solutions presented in this paper underscore the importance of support in the learning process, in particular the course design and materials. A corollary to this is the importance of ***relevance*** — being able to make connections to the outside world. Donovan, Bransford and Pellegrino (2000) proposed that "learning is influenced in fundamental ways by

the context in which it takes place" (p. 22). Support ought thus to be given to student teachers so that they can acquire the required knowledge, skills and attitudes and translate these to school and classroom teaching experiences. In the authors' view, this is the acid test to measure the effectiveness of an educational course.

Implications

1. Provide sufficient tutorial time to allow maximum learning to take place.
2. Provide support structures to help student teachers cope with the reading materials.
3. Create learning opportunities to make connections between theory and practice.
4. Provide support structures to sharpen student teachers' reading skills
5. Give equal importance to the process of learning as well as the product of learning.

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REACT aims to keep trainee teachers and practicing teachers, school principals, academics and educational administrators abreast of recent advances in research in education.

The editorial committee welcomes contributions for future issues. The journal is published bi-annually, in June and December. The deadline for the June issue is March 1, and September 1 for the December issue. Contributors should send four paper copies of their article to:

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Format

- Articles should normally be 2000--3500 words long.
- Review articles should follow the format of previous issues as far as possible: Introduction – Review – Discussion – Conclusion – Implications –References.
- Sources should be listed at the end of the article following APA style:

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  Clark, M.M. (1974). *Teaching Left-handed Children.* London: Hodder and Stoughton

- In-text citations should cite author's surname and year of publication, all within parentheses, e.g. (Bloom 1981, p.15).
- Footnotes should be avoided. Words and phrases underlined in the manuscript will be printed in italics.
- Manuscripts should be typed double-spaced on A4 with 1" margins. Tables, diagrams and figures included should be camera-ready Photographs can be submitted electronically or as clean originals. Writers are advised to keep copies of all submissions.
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