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**McGILL
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**On the Association Between Modes of
Mental Representation and Mathematics
Experience in Teacher Education**

PENELOPE J. GURNEY

**The Potentials and Problems
of Diversity in Chinese Education**

JING LIN & HEIDI ROSS

**Integration of Computers into the Curriculum:
How teachers may hinder students' use of computers**

XIUFENG LIU, ROBERT MACMILLAN, & VIANNE TIMMONS

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EDITORIAL

BENEFICIAL RESEARCH FROM THE FIELD

Although this issue has no explicit theme to tie together the papers we have chosen to publish, the overall implicit message is that research in many areas of education is adding to the richness of the field. We present the following papers in their order of appearance in the Journal.

The way in which Professor Gurney approaches her study on the cognitive development of education students and their math studies is indeed original and the results are informative. The study makes a direct link between the degree of experience in mathematics and the ability to utilize different modes of mental representation. In this article, Professor Gurney points out that some education students who avoid math as much as possible ultimately find themselves in a classroom teaching math as a part of the course of study. That fact and the finding that differences do exist in the mental representation modes of persons who have studied no math and those who have a small level of experience have important implications regarding teacher education.

In previous issues some of the complex issues of Chinese education have been brought to our attention by Professor Jing Lin. Again, Professor Lin and co-author Heidi Ross, have completed a comprehensive piece of research on the diverse and rapidly transforming structures and purposes of Chinese secondary education. The results of their research are intensely interesting and the manner in which the contrasting differences in the learning environments, teacher qualifications, and alternative types of Chinese schools give us a perspective that is fresh and new.

As Mr. Abdi makes quite clear to us, post-apartheid South Africa has brought many positive changes to black women and their quest for education. However, black women lag far behind other women and much farther behind other population sectors in their ability to gain

access to higher education and economic independence. The article makes clear that the reduction of expenditures on public education will cause black women's advancement in education to suffer in the long-run.

Professors Liu, MacMillan, and Timmons give us a reality check on the use of computers in the classroom. In their research findings in Nova Scotia, they have come to the conclusion that there is still a limited use of computers in the classroom; however, students continue to demonstrate a positive attitude toward their use. It may be that the limited usage of computers is not so much a matter of students' attitudes toward them, but perhaps the situation stems more from the constraints communicated by teachers who have practical difficulties and less than positive attitudes toward computers themselves.

In our section, "Reports from the Field", Professor Kepron gives a report of a study he has done on the use of Marie Clay's *Reading Recovery* program. It is informative that Kepron summarizes the value of this reading program, but what is most important is his candid explanation of some of the program's limitations.

Taken all together, these research articles make a substantial contribution to the ever-growing body of knowledge about teaching.

W.M.T.

ON THE ASSOCIATION BETWEEN MODES OF MENTAL REPRESENTATION AND MATHEMATICS EXPERIENCE IN TEACHER EDUCATION

PENELOPE J. GURNEY *University of Ottawa*

ABSTRACT. The purpose of this study is to examine one aspect of the cognitive development of preservice education students; i.e., the ability to utilize different modes of mental representation. This study attempts to provide a basis for understanding the relationship between the degree of experience in mathematics and the ability to utilize different modes of mental representation, using the "Modes of Thought Questionnaire" (MOTQ) of Aylwin (1985).

In the study, associations were found between the level of experience in mathematics and both the ability to utilize each mode of mental representation and the overall use of the preferred modes. This study has implications both for future research and for education. First, it gives a clear indication that differences do exist between the mental representation modes preferred by individuals with no mathematics experience, as compared to those who have even a small level of experience in mathematics. Second, it provides implications regarding teacher education in Ontario, which arise from these differences in the utilization of all of the modes of mental representation and knowledge acquisition.

RÉSUMÉ. Cette étude traite d'un versant du développement cognitif des professeurs stagiaires, c'est-à-dire de la capacité à utiliser différents modes de représentation mentale. Elle vise à établir les fondements permettant de comprendre la relation qui existe entre le niveau d'expérience des mathématiques et la capacité d'utiliser différents modes de représentation mentale mesurée à l'aide du questionnaire MOTQ d'Aylwin (1985).

On a constaté qu'il existe un lien entre le niveau d'expérience des mathématiques, d'une part, et la capacité d'utiliser différents modes de représentation mentale et l'utilisation globale des modes de prédilection, d'autre part. Cette étude aura des répercussions sur les recherches et l'éducation. Elle révèle tout d'abord qu'il existe des différences entre les modes de représentation mentale que préfèrent ceux qui n'ont aucune expérience des mathématiques et les modes que privilégient ceux qui possèdent un peu d'expérience dans ce domaine. L'incidence que cela pourrait avoir sur la formation des enseignants en Ontario tient aux différences observées dans l'utilisation de tous les modes de représentation mentale et l'acquisition des connaissances.

There is a cycle of lack of success in mathematics study in many school systems. That is, a student who is having difficulty in learning mathematics may cease to study this discipline, but a few years later become a teacher, and be obliged to teach mathematics. The students attempting to learn mathematics in such a teacher's classroom may then have difficulty in learning mathematical topics. Hence the cycle continues.

An opportunity to break the cycle exists during the preservice education year at faculties of education. In order to do this, however, fundamental research must first be carried out into the nature of the lack of success of mathematics. The long-term persistence of this problem is reflected in the fact that, despite all the changes in teaching methods and curricula over the years, and despite the current stringent entrance conditions to the education program, little improvement has been noted. Hence researchers are attempting to change the focus of research, to examine more personal factors such as that of cognition, where this research is situated. In particular, this study attempts to compare the degree of mathematics experience of the preservice education students to their utilization of different modes of mental representation.

NATURE OF THE STUDY

Each preservice education student comes to teacher education with a history of mathematics experiences which may have been positive or negative in nature. A student may have been successful or not successful in the mastery of various mathematical topics or concepts as presented in academic courses. Students registered in the one-year program are aware that certification in Ontario, as elsewhere, presupposes competence in mathematics to the grade 10 level, and hence know that the teaching of mathematics will be an integral part of their teaching responsibilities. Even further, some of these students may be required to teach mathematics content which they themselves avoided in school, such as the solution of equations, geometry, or percentage. As Park (1990) stated, some *preservice* education students may not have had any mathematics experience since grade ten. In his words, "They teach mathematics and science because they are required to, not because they have special training" (1990, p. D2). Each student has also developed an individual approach to learning, one aspect of which is the utilization of modes of mental representation. It is the association between experience in mathematics and utilization of modes of mental representation which the present research attempts to explore.

The difficulty with modes of mental representation is that one cannot be sure that the model being used is correct. The cognitive models which theorists have developed are based on the external actions of individuals, and the nature of the mental processes behind the actions cannot be easily discerned. These models attempt to explain how the continuous barrages of sensory stimuli that assault the individual are configured into understandable forms which become personal models of reality (Agnew & Brown, 1989; Howson & Kahane, 1990). This selective attention to stimuli, and the resulting creation of mental models of reality, form the basis of constructivist theories.

Many theorists in this field appear to present views which are consonant with Jerome Bruner's theory of cognitive development. One of these, Susan Aylwin, has written a clear, concise description of modes of representation and how they develop. Her work is important for two main reasons: first, her concept of mental representation may have a bearing on the differing abilities of students to master the concepts required in the study of mathematics; and second, she has developed empirical instruments which can be used to evaluate the different forms of mental representation used by individuals.

Aylwin, along with others (Bruner, 1964; Horowitz, 1972), posits three modes of mental representation that are sequentially acquired in the developmental process of individuals. Aylwin's modes are reminiscent of those of Bruner's enactive, iconic, and symbolic forms of mental representation, except that she considers them to be mental images (1985). She calls the first form of representation "enactive imagery", and states that this form is kinaesthetic in nature, involving muscular tension in the same way as Bruner's enactive form of mental representation. It involves, according to Aylwin, imagined action and role playing. Her second form of representation is that of "visual imagery". She uses the "pictures in the mind's eye" metaphor to describe this representation, and suggests that there are parallels between the mental processing of a stimulus being viewed by the eye, and of mental images, either of things seen previously and remembered, or of completely imaginary things. The third form of mental representation is, for Aylwin, "verbal imagery". This is a form of inner speech, with the same properties as outer speech. It is used to code information, and to handle conceptual and abstract thought. She states Vygotsky's view, that there are structural differences between inner and outer speech, in that inner speech is highly contracted, and contains mostly predicates without

subjects. Verbal imagery, by this definition, consists of words and sound, and is structured categorically and hierarchically.

The actual proficiency level demonstrated in the use of each representation differs amongst individuals. Some use more enactive levels of thought, some use more iconic, and some use more symbolic. The majority of people use all three forms in different circumstances, but to differing degrees. Aylwin makes the further conjecture that the three modes of mental representation may use different cognitive structures, and hence may have different kinds of affects and feelings associated with them (1985). She suggests, moreover, that this gives rise to three personality styles, namely verbalizers, visualizers, and enactive imagers.

The modes of thought questionnaire

Aylwin (1985) states that adults, in general, have personal preferences in the utilization of modes of representation to solve specific tasks. She has developed an instrument to assist in her research into mental representation, called the MOTQ or *Modes of Thought Questionnaire*. The purpose of the instrument is to evaluate individual preferences in modes of representation, and hence to assess representational biases through their "characteristic cognitive structures" (p. 66). In other words, Aylwin measures, with the MOTQ, the ability of an individual to comply with directions to utilize particular modes of mental representation, and she observes the actual modes used in the process.

Aylwin has used the MOTQ to examine the biases evinced towards the modes of representation by students preparing for different careers. A strong bias for verbalization was found in commerce students; visualizing was found to be associated with arts and social science students, particularly women; and engineering students were found to have a bias for enactive imagery.

The relationship between preferred modes of representation and careers is interesting in light of the current question, concerning the possibility that the relative ability to utilize the three modes of mental representation has a bearing on the ability of a student to master mathematics in general, and specific topics within the discipline, such as geometric proof, or the solution of three equations in three unknowns. To examine this relationship in greater depth, it is necessary to examine the three modes of mental representation more closely.

Aylwin considers each mode of representation to be a way of thinking, in that a particular representation of reality directs one's thinking into

a path related to the representation. Each mode of thought can be understood as being a way of making sense of the world, in that paying attention to the same object, but using different modes of representation, may result in different outcomes. These different ways of making sense of the world by individuals who use different modes of representation have an important implication for the present research. For example, in school-based learning, it may be that the mode of representation used by the student influences the understanding of and response to different kinds of lessons presented by teachers, as well as the degree of attention paid to specific subject material. Moreover, the degree of learning taking place in classrooms may be influenced by the degree of similarity between the modes of mental representation used by students and teacher.

One can consider, for example, the mathematical problem of finding the distance across a lake without employing direct measurement. The visualizer might focus on the lake itself, and look in depth at a mental image of the lake in question, to find clues to the problem solution. The verbalizer, on the other hand, might imagine a hierarchy of problem-solving techniques, in which "lake, distance across" would be a category, and various methods of solution would be written in a table. The enactive imager might imagine the physical process of taking measurements, walking, and so on, to determine a method of solution. Hence a different preference in mode of mental representation between individuals may reflect a different approach to problems. The teacher who thinks only of one type of solution will not necessarily "get through" to students who have other frames of reference.

More specifically, it is plausible to suggest that achievement in school subjects preferred by students may depend upon their ability to represent the content in the appropriate mental modality. Overuse of a preferred mode of mental representation, according to Aylwin (1985), Rancourt (1978), and Royce (1964), may bring a student to handle easily only one of the possible three modes. Hence students who do not succeed in mathematics may show a particular hierarchy of use of the three modes of mental representation.

Statement of hypothesis

The hypothesis that arises from the theoretical framework and the review of the research literature on the construction of mental representation can be stated as follows: There is an association between levels of experience in mathematics and the degree of effective utiliza-

tion for each of the three modes of mental representation, as measured by Aylwin's MOTQ (1985).

METHODOLOGY

This study examines the mental representation of preservice education students in Ontario. The instrumentation, Aylwin's MOTQ, is designed to determine individual preferences in the utilization of the three modes of mental representation. The questionnaire is concerned with how a subject responds to the associations between ideas. It examines the underlying assumption that thinking in different modes results in different associations.

The MOTQ is a word association test, in which the subject is directed to think in a particular way for words that provide a specific stimulus. For example, to encourage an individual to use the visual form of mental representation, instructions are given to the subject to see a picture in the mind's eye after being presented with a stimulus word, and then to write down the first association to the image which comes to mind. Each response is then coded as to mode of mental representation utilized. For example, if the stimulus word is "baboon", then a response of "a great ape" would be classified as verbal; a response of "shaggy fur" would be classified as visual, and a response of "afraid" or "I'm swinging in the tree" would be classified as an enactive response. Some associations, however, particularly synonyms, cannot be coded, since it is not possible to distinguish the mode of mental representation employed in making the association. The stimulus words are carefully chosen so that they may evoke different responses, for the test is an attempt to find out whether or not the subjects can continue to use a directed mode of mental representation over a period of time.

The data resulting from the MOTQ consist of numerical scores of the utilization of each of the three modes of mental representation, for each section of the questionnaire. There are data concerning the utilization of a mode when told to do so, and also the utilization of one mode when requested to use a different mode. There are 24 stimulus words in the MOTQ for each of the three modes of mental representation, and a subject who is very adept at all three ways of mental representation can theoretically achieve a score of 24 on each of the three modes. In practice, however, this does not often occur. Rather, one mode of mental representation tends to dominate to some extent, and scores on any one mode may vary widely.

The MOTQ has been used previously to determine the preferred hierarchies of modes of mental representation of Australian university students in the fields of engineering, commerce, and the arts. In all, more than 2,000 students participated in studies using the MOTQ. The results have been found to be reliable, in that the findings correlate well with research from Witkin, Ashton, J. Richardson, and others (Aylwin, 1985; Richardson, 1969; Witkin & Goodenough 1981). The test-retest reliability ranges from .69 to .84 on the three aspects of the instrument, for a seven-week period, while the Cronbach alpha measures range from .83 to .89 on the three aspects of the instrument. Construct validity was tested using principal axis factor analysis on the subscales. The highest loading subscales on each factor were, indeed, those appropriate to the relevant mode of representation. In an earlier survey of instruments testing modes of mental imagery, White, Sheehan, and Ashton (1977) found a surprising agree of reliability for word association tests of modes of mental imagery, while some researchers (Richardson, 1969) make the connection between mental images and mental representation.

Two different versions of the MOTQ are actually used in this study: the MOTQ-1 and the MOTQ-2. They differ in two ways: first, that the MOTQ-1, the original instrument, requires triple the amount of time to complete, and second, that in the MOTQ-1, the subjects are asked to judge the probability level which they would give to pre-determined word associations; whereas the MOTQ-2 allows subjects to give any word association. This second difference is important, in that many phrases in the MOTQ-1 are specific to British or Australian culture, in that terms such as "badgers" or "traffic wardens" are not common words in the vocabulary of North Americans. The MOTQ-2, on the other hand, allows a subject to make any desired association, and hence is more acceptable.

Since the psychometric data concerning the MOTQ instrument were evaluated using the MOTQ-1 (Aylwin, 1985), a small subsample of approximately 35 subjects completed this questionnaire in addition to the MOTQ-2. A delay of six months was allowed between the completion of the two instruments, since it was felt that there would be a risk of remembered responses. The results provided by the two MOTQ questionnaires were compared. The Pearson product-moment correlations between the two MOTQ questionnaires were .60 for the Verbal mode, .62 for the Visual mode, and .53 for the Enactive mode. The correlations between the two MOTQ questionnaires appear not to be as high as one might expect for two tests which purport to measure the

same modes of mental representation. The range of correlations found, however, must be considered in the light of the following two factors. First, some of the vocabulary of the MOTQ-1 was indeed confusing to the subjects, since they were not of British origin. Second, allied to the first, is the fact that the majority of subjects rated some common British associations as being very unlikely, although these were listed as being very likely on the coding charts. In examining these data, the phrases which were unknown to the students are precisely those which bring the correlation down.

The MOTQ-2 was selected, therefore, because of the freedom from such cultural bias, in that any association made by the subjects could be coded regardless of language used, providing that a possible coding existed. This was necessary, since the students in Ontario faculties of education reflect the multicultural reality of the province today.

Sample description

The subjects who participated in this study were taken from the population of preservice education students registered in various 1990-91 Bachelor of Education programs in the province of Ontario. These are one-year programs following an undergraduate degree. Permission to conduct the study was received from the universities concerned, in the Eastern and Mid-North regions of Ontario. Participation in the study was on a volunteer basis, and was invited according to the general guidelines set by a university ethics committee.

A total of 223 subjects took part in the study. The responses of eight subjects were discarded because they either did not understand the instructions, did not complete both questionnaires, or did not identify themselves. The final sample consisted of 215 subjects. Of that total, eighty-six were planning to teach younger students in grade six or lower, while 129 were planning to teach older students in grade seven or higher. The gender breakdown of these subsamples is provided in Table 1, as is the breakdown by mathematics experience, age, subject major at university, and experience in mathematics. The numbers in this table reflect the fact that four of the 215 subjects did not indicate gender during the testing session.

The ages of subjects ranged from 20 to 54, with a mean age of 28.3 years and a median age of 26. Approximately one third of the subjects came directly into preservice education studies after graduation from university training (37.1% were under 25 years of age), while approximately

one in every six subjects (16.7%) were more than 34 years of age, and hence had a considerable gap between university training and entrance into the faculty of education.

Various samples of subjects were formed from the data. The main set of subsamples was formed on the basis of different levels of experience in mathematics, in order to test the hypothesis. A second set of subsamples was also formed based on programs of study: both those followed during post-secondary education of subjects, and those followed during the year of teacher education. The subsamples formed according to programs of study during post-secondary education were used in a more specific analysis than that possible with the main sample. This analysis provides additional support for the findings from the main sample with respect to the hypothesis.

The criteria for the placement of subjects in the sample of "degree of mathematics experience" were as follows. The first subsample, the "no experience level in mathematics" subsample, consists of subjects who have no mathematics experience of any type at the post-secondary level. They have not studied mathematics, nor have they studied any related disciplines such as science, nursing, engineering, or kinanthropology which use mathematics in their programs of study. The fourth subsample, the "high mathematics experience" subsample, consists of subjects who have taken at least 6 courses in mathematics at the post-secondary level. These two subsamples comprise approximately half of the total. The remaining subjects in the sample are differentiated by means of their mathematics experience, into two subsamples respectively: by the study of mathematics directly, and by the study of courses which contain a considerable mathematical content. Such courses are taken into consideration in the subsample composition, so as to provide a means by which the two middle subsamples, the "low experience level" and "moderate experience level" subsamples of mathematics experience, can be determined. The breakdown of the sample with regard to mathematics experience is shown in Table 1.

In this table, the four subsamples are seen to be approximately equal in size, with percentages of subjects ranging from 23.7% to 27.9%. The subsamples formed with respect to mathematics experience are also found to be similar to one another with respect to age and experience in the workplace. The second method of grouping by mathematics experience involves the subsamples formed according to university majors. These provide a different way of examining the effect of math-

TABLE 1. Description of subjects (n=215)

BREAKDOWN BY GENDER AND PROGRAM OF STUDY

Program of study	Male		Female		Total	
	N	%	N	%	N	%
Grades 1 to 6	15	7.1	70	33.2	85	40.3
Grades 7 up	56	26.5	70	33.2	126	59.7
Total ^a	71	33.6	140	66.4	211	100.0

BREAKDOWN BY MATHEMATICS EXPERIENCE AND AGE

Mathematics Experience	N	%	Age Range	Average Age	Median Age
None	60	27.9	22 - 54	29.2	27
Low	51	23.7	22 - 44	28.8	26
Moderate	53	24.7	21 - 50	27.2	25
High	51	23.7	20 - 54	27.8	24
Total	215	100.0			

BREAKDOWN BY UNIVERSITY MAJOR AND MATHEMATICS EXPERIENCE

University Subject Major	N	%	Average Number of Courses Taken Containing Mathematics	
			Math Only	Math-Related
Languages	26	12.5	0.10	0.9
Humanities	50	24.0	0.72	6.1
Physical Ed.	23	11.1	2.80	13.9
Life Science	39	18.7	4.17	18.4
Science	28	13.5	4.74	20.8
Mathematics	42	20.2	9.40	26.7
Total ^b	208	Average	3.80	14.8

^a - 4 subjects did not indicate gender

^b - 7 subjects did not have any of these majors of study

ematics experience, since different university majors involve different numbers of courses in mathematics and mathematics-related courses, as illustrated in Table 1. Of the group who have studied languages, for example, a total of one subject in ten has studied one course in the mathematics department, leading to an average of 0.1 course for the group. Nine out of ten of these individuals, then, have taken no courses at the post-secondary level such as science, nursing, and kinanthropology, which contain any mathematics at all.

Whether one lists only the actual mathematics courses taken, or whether one includes the courses such as physics or geological science which involve the use of some mathematics, the programs of study sort into the same order, with the language majors having the least experience in mathematics, and the mathematics majors, the most experience in mathematics. In the third portion of Table 1, the total number of subjects is 208, since the remaining seven subjects, mainly music majors, are too few in number to form a viable group.

Statistical methods used in data analysis

Various statistical techniques are utilized in the analysis of data in this study. In the examination of categorized data such as that derived from frequencies of subjects with particular dominant modes of mental representation, the nonparametric procedure of Chi-Square is used. Contingency tables are formed to examine various subsamples on the basis of the dominant modes of mental representation. Multivariate analyses of various kinds, including multiple regression and principal component analysis, are also carried out on these data.

In a further analysis of individual scores achieved in the subscales of the different instruments, the scores are treated as continuous data, by use of the parametric ANOVA procedure. The ANOVA procedure is used primarily to test for significant differences in utilization of the three modes of mental representation as measured by the MOTQ in the groupings by university major, and by mathematics experience. Wherever the null hypothesis is rejected, post hoc analysis is carried out by means of Scheffé's procedure, a robust method of analysis for unequal sample sizes such as those present here.

RESULTS AND DISCUSSION

With regards to the MOTQ, there are two aspects to consider in the examination of the "degree of effective utilization" of the modes of mental representation. In the MOTQ, the subjects are directed to utilize each of the modes in specific portions of the test. If a subject is able to utilize a particular mode when directed to do so, then the subject should utilize the visual mode on the visual portion of the test, and so on. For this reason, the first aspect of effective utilization is the degree of compliance to an instruction to use a particular mode; that is, the degree of individual control. The second aspect of effective utilization to consider is the personal preference of use of each mode of mental representation by subjects, regardless of instructions given.

TABLE 2. Utilization of modes of mental representation

Degree of compliance to direction to use each mode	MATHEMATICS EXPERIENCE GROUPS							
	1		2		3		4	
	NONE		LOW		MODERATE		HIGH	
	N	%	N	%	N	%	N	%
Uses directed mode	23	38.3	27	53.0	33	62.2	40	78.4
Does not use directed mode	37	61.7	24	47.0	20	37.8	11	21.6
Totals	60	100.0	51	100.0	53	100.0	51	100.0

The actual ability on the part of a subject to utilize a particular mode of mental representation, when directed to do so, is not consistently demonstrated in the data. In Table 2, the percentage of subjects with the ability to do this is recorded. If the subject uses each of the three modes as directed, then the correct dominance is said to occur; otherwise, the subject is said to have incorrect dominance. The threshold of correct dominance for each mode is set at 80% use of the directed mode, since the percentage of subjects using the appropriate mode remains approximately the same (between 80% and 95%), while few subjects have greater accuracy.

In Table 2, the degree of direction compliance to utilize a particular mode of mental representation is presented in relation to the "levels of experience" in mathematics of each subject. The results of testing for appropriate use of the three modes of mental representation are shown to be mixed, in that many subjects do not use the particular mode which they are instructed to use. In this table, one can note that the percentage of subjects utilizing all three modes, as directed to do so, increases as the amount of experience in mathematics increases. The percentages of subjects utilizing these modes as directed, range in a steady progression from 38.3% for the subsample with no mathematics experience, to 78.4% for the subsample with considerable mathematics experience.

The findings displayed in Table 2 are examined by means of a four by two contingency table, comparing mathematics experience to correct and incorrect mode utilization. At the 0.01 level of significance, an association is found to exist between levels of mathematics experience and the appropriate utilization of the modes of mental representation ($\chi^2 = 15.73$, $df = 3$). The chief difference is found in the two extreme subsamples: the "no experience level" of mathematics, and the "high experience level" of mathematics. In these, significantly more subjects in the subsample with a high level of experience in mathemat-

ics are able to utilize the modes as directed, than in the group with no math experience.

The second aspect of "effective utilization" of the modes of mental representation, namely that of overall utilizations of each mode of mental representation, is examined in Table 3 for the same four subsamples. For example, the number of times that the verbal mode is used is recorded without regard to the requested mode. The average raw score of the majority of subjects is highest in the visual mode, as expected from the history of the MOTQ, since in Aylwin's (1985) work, students in the social sciences, and women in general, have been found more likely to have visual dominance. In this study, the sample contains many subjects who fall into these two categories. The degree of utilization of the three modes of mental representation for each subject is therefore calculated by comparison with the average score on each particular scale, in order to accentuate the differences among the subsamples of subjects. The dominant mode is defined as the mode in which the score of the subject is farthest away from the mean score: in other words, it is the mode used most frequently, as compared to the mode used by the average subject. It should be noted, moreover, that this method of calculation for the dominant mode provides the same statistical results as does the use of raw scores, but the information is presented in a more accessible form.

TABLE 3. Mental representation and mathematics experience

Mathematics Experience Level	DOMINANT MODE OF MENTAL REPRESENTATION							
	VERBAL		VISUAL		ENACTIVE		TOTAL	
	N	%	N	%	N	%	N	%
None	5	11.1	28	62.2	12	26.7	45	100
Low	17	42.5	6	15.0	17	42.5	40	100
Moderate	20	44.4	7	15.6	18	40.0	45	100
High	12	33.3	8	22.2	16	44.4	36	100
Total	54	32.5	49	29.5	63	38.0	166	100

As shown in Table 3, verbal dominance is observed to range from 11.1% in the "no experience level" subsample, to 44.4% in the "moderate experience level" subsample. Visual dominance ranges from 15% in the "low experience level" subsample to 62.2% in the "no experience level" subsample. Finally, enactive dominance ranges from 26.7% in the "no experience level" subsample, to 44.4% in the subsample with the "high experience level" in mathematics.

The subsample with the “no experience level” in mathematics appears to stand apart from all other subsamples. This difference does not appear to be related to the level of mathematics experience, or one would expect a steady progression in scores. This does not occur, but rather it appears that the three groups with math experience are alike, no matter what the level of experience.

The results from Table 3 are examined by means of a four by three contingency table. At the 0.01 level of significance, an association is found to exist between “level of experience” in mathematics and dominant mode of mental representation (Chi-square = 34.5, $df = 6$). More specifically, the subsample of subjects with the “no experience level” in mathematics is found to differ from the other three subsamples in terms of use of the verbal and visual modes of mental representation. No significant difference is found, however, among the subsamples regarding the enactive mode of mental representation.

Each of the three mode scores is examined separately using multiple linear regression analysis with variables age, gender, level, and percentage of courses in mathematics, science, life science, and the humanities. The result confirms the findings of the ANOVA analyses, and provides a little information concerning one or two other variables. In particular, age is found to be of slight statistical importance to the visual mode score ($p = 0.022$), and science is found to have a slightly greater impact on the scores than does mathematics. Principal component analysis also confirms the findings from the other statistical analyses, but does not add new information.

DISCUSSION OF FINDINGS

The research hypothesis, that there is an association between levels of experience in mathematics and the utilization of different modes of mental representation, cannot be rejected. Specifically, a lack of experience in mathematics appears to be related to an inability to utilize correctly all three modes of mental representation when directed to do so (Table 2). Furthermore, a high level of experience in mathematics is related to a relatively high degree of ability to utilize all three modes of mental representation when directed to do so. The differences among the three groups with some mathematics experience are not, however, statistically significant, although all three groups are significantly different from the group with no mathematics experience on this measure. The subsample of subjects with no mathematics experience is found,

moreover, to have a statistically significantly lower utilization of the verbal mode of mental representation, and a higher use of the visual mode, than do the other subsamples. In summary, then, the research hypothesis is confirmed: that there is a difference in degree of effective utilization of the three modes of mental representation which is associated with level of experience in mathematics. The greatest difference is found in the use of the verbal mode, a mode associated with organization and logic.

There is, however, no significant difference in the ability to use a particular mode of mental representation among the three subsamples with some mathematics experience. Even the subjects in the subsample with low experience in mathematics, however, have up to 15 post-secondary courses in subject majors which require some expertise in mathematics, such as physics, computer science, and kinanthropology. The subjects in the subsample of "moderate experience level" in mathematics have, moreover, taken from 16 to 34 courses in subjects which require a considerable degree of mathematics experience.

It is therefore possible that the mathematics studied in a mathematics course, and mathematics studied within a physics, or other non-mathematics course, both provide similar practice in the uses of the different modes of mental representation. For example, the understanding required to calculate the trajectory of a javelin in a kinanthropology course may not differ from the understanding required to calculate velocity of a projectile in a calculus course. Only the frame of reference is changed; the problem is the same.

It can be argued, then, that mathematics experience that is obtained solely in mathematics courses does not differ from mathematics experience in related courses. This, however, was not examined by Aylwin, who was interested in broader differentiation amongst areas of study.

Exploratory analysis

The results described above, concerning the hypothesis and the MOTQ, are those resulting directly from the research. There are, however, other findings of interest to this hypothesis, which arise from the data generated during the study. The MOTQ is not designed solely to identify the dominant mode of an individual. Rather, as Aylwin states, it "assumes that each person uses all the forms of representation, with the balance varying between individuals" (1985, p. 67). Hence, in the examination of the utilization of the modes of mental representation, the scores

achieved on each of the subscales of the MOTQ were next examined, rather than just the dominances.

The data on scores achieved on the subscales of the MOTQ permit a deeper analysis of the major differences between subjects who have prior experience in mathematics, and those who do not. Table 4 provides the mean scores and their standard deviations, on each of the three modes, for each of the subsamples formed with respect to mathematics experience. The average scores of the subsample with no experience in mathematics are lower on the verbal and enactive scales, and higher on the visual scale, than are the scores of the other three subsamples. Table 4 indicates again that there does not appear to be a progression in scores as experience in mathematics increases; in fact, the scores achieved on the three scales, by the three subsamples with at least some mathematics experience, are very similar, as shown earlier in Table 3.

TABLE 4 Means and standard deviations of the mathematics sub-samples on the MOTQ

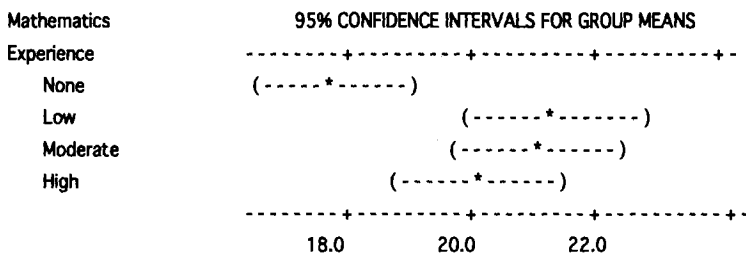
Mathematics experience	N	MODE OF MENTAL REPRESENTATION					
		VERBAL		VISUAL		ENACTIVE	
		M	SD	M	SD	M	SD
None	60	17.87	5.45	22.67	4.30	18.07	6.68
Low	51	21.30	5.05	18.71	3.30	20.41	7.28
Moderate	53	21.28	5.73	19.00	4.15	20.61	5.17
High	51	20.07	4.22	19.30	3.32	21.24	4.80

The three modes shown in Table 4 are examined separately for the four subsamples of subjects organized with respect to mathematics experience. As earlier in Table 3, it appears that the subsample of subjects who have not studied any mathematics, either in mathematics courses, or indirectly, as part of other courses, portray a different profile than do the subjects in the subsamples "low experience level", "moderate experience level", and "high experience level" in mathematics. The scores achieved in the "none level of experience" mathematics subsample appear lower on the verbal mode and enactive mode, and higher on the visual mode, than do the scores of the other three subsamples.

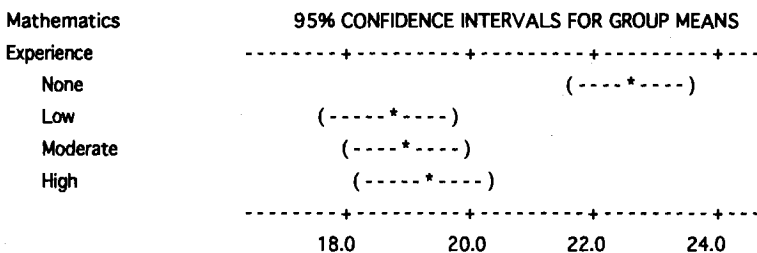
The scores achieved on each of the three subscales, for each of the four subsamples, are analyzed using a series of one-way ANOVAs, shown in Table 5. The one-way ANOVA of the verbal mode scores demonstrates that the means achieved by subjects among these four groups are distinct at the 0.05 level of significance, and thus that, as a whole, the subsamples are not all taken from the same population.

TABLE 5. ANOVAs of scores on the MOTQ by mathematics subsamples

ANOVA OF MOTO VERBAL SCORES					
SOURCE	DF	SS	MS	F	P
Math Group	3	414.8	138.3	4.88	0.003
ERROR	211	5973.4	28.3		
TOTAL	214	6388.2			



ANOVA OF MOTQ VISUAL SCORES					
SOURCE	DF	SS	MS	F	P
Math Group	3	592.2	197.4	12.78	0.000
ERROR	211	3258.2	15.4		
TOTAL	214	3850.4			



Post hoc analysis, using Scheffé's procedure, reveals that the subsample with no mathematics experience has significantly lower scores on the verbal mode of mental representation than do the subsamples with low or moderate levels of experience in mathematics. The difference between the subsamples of subjects with no experience and with high experience, however, is not statistically significant. This is shown in the set of confidence intervals in Table 5, which provides a visual illustration of the differences among the subsamples.

This is interesting, in that most of the mathematics experience obtained by subjects in these two subsamples has occurred outside of the mathematics department. That is, the mathematics studied by these subjects has been to a large extent, applied mathematics, such as that in kinanthropology, science, or similar areas. The finding illustrated in Table 5 supports the suggestion made in the discussion of the hypothesis, namely that the effect of the mathematics studied in a mathematics faculty or department does not appear to differ from that of the mathematics learned in a course in a different department or faculty.

The visual mode scores are examined in the same way as the verbal mode scores. The mean of the subsample with no experience in mathematics is statistically different from the means attained by each of the other subsamples. The average scores of the subjects in this subsample are higher than those of the other subsamples. These data are illustrated in the confidence intervals of the subsample means, found in Table 5.

When the enactive mode scores are examined, it is found that the mean score of the subsample of subjects with no mathematics experience is lower than the scores obtained by the individuals in the other three subsamples, and that there is a steady progression of means scores from 18.07 to 21.24, as shown in Table 4, but that these differences are not found to be significant statistically.

The greatest differences lie, therefore, in utilization of both the visual and verbal modes by the subsample of subjects with no experience in mathematics as compared to the subsamples with low and moderate experience in mathematics. The subsample with the highest level of mathematics experience is not as far away as the two middle groups. These findings support the position that mathematics in itself does not provide the only answer for differing uses of the modes of mental representation.

There are two possible explanations for this: first, that perhaps mathematics is not the only factor playing a role in the use of the three modes of mental representation; and second, that the composition of the subsamples is perhaps too heavily weighted in favour of mathematics taught in mathematics courses, rather than in applied mathematics. It is even conceivable that the students of mathematics alone, with perhaps 10 courses, had effectively less exposure to the practical use of mathematics than science students with as many as 18 courses with a strong mathematical content.

Subsamples of post-secondary areas of concentration

The four subsamples formed with respect to mathematics experience are, in one respect, not as satisfactory as one would expect, since the separation between the subsamples is not clear-cut. In light of this, a re-examination of subjects as to academic profile was undertaken, in which an analysis of the program of study of each subject at the post-secondary level was done. The results indicate that the academic concentrations clearly differentiate the mathematics experience of the subjects, and hence provide a different focus for an examination of the relationship between mathematics experience and of utilization of the three modes of mental representation.

Six subsamples of subjects were formed according to the academic areas of concentration, or majors, at university. These areas of concentration are humanities, languages, mathematics, physical education, science, and life science. The subjects with other majors, such as music, are too few in number and hence are not included in this portion of the study. The results of the re-examination are provided in Table 6, wherein the results for the subsamples are listed in increasing order of average number of courses in mathematics studied at the post-secondary level. The numbers of such courses range from an average of 0.10 of a mathematics course for the subsample of subjects with language majors, to an average of 9.40 courses for the subsample of mathematics majors.

The confidence intervals of Table 6 illustrate a steady progression of means for most areas of concentration. The progression for the verbal mode means is an increasing progression, while the progression for the visual means is a decreasing one. *Post hoc* analysis on these findings, using Scheffé's procedure at a confidence level of 0.05, shows a significant difference between the scores of the language subsample and of the science subsample on both the verbal and the visual measures, and between the scores of the humanities subsample and the science subsample on the visual mode.

The subjects who studied languages at university are found to differ significantly from those who studied science, on both the Aylwin verbal and visual measures. On the verbal measure, the mean of the language subsample is 16.94, while that of the science subsample is 21.88. On the visual measure, the mean of the language subsample is 22.41, while that of the science subsample is 17.57. The subjects who studied humanities, on the other hand, differ significantly from the science majors on the visual mode, but not on the verbal. The enactive mode mean scores are

also examined with respect to these subsamples of subjects. In this analysis, there is neither a progression according to mathematics experience, nor any significant differences among the subsamples formed with respect to post-secondary programs of study.

TABLE 6. MOTQ subscale scores vs post-secondary area of concentration

ANOVA OF VERBAL SCORES BY AREA OF CONCENTRATION					
SOURCE	DF	SS	MS	F	P
subsample	5	408.6	81.7	2.81	0.018
ERROR	205	5964.4	29.1		
TOTAL	210	6373.0			

Area of concentration	N	VERBAL		95% CONFIDENCE INTERVALS FOR MEANS	
		M	SE		
Languages	25	16.94	5.42	(-----*-----)	
Humanities	46	18.99	15.40	(-----*-----)	
Phys. Ed.	25	20.09	6.42	(-----*-----)	
Life Sci	43	20.76	5.47	(-----*-----)	
Science	28	21.88	6.47	(-----*-----)	
Maths	43	20.83	3.53	(-----*-----)	
				-----+-----+-----+-----+	
				15.0 17.5 20.0 22.5	

ANOVA OF VISUAL SCORES BY AREA OF CONCENTRATION					
SOURCE	DF	SS	MS	F	P
subsample	5	377.4	75.5	4.53	0.001
ERROR	205	3418.7	16.7		
TOTAL	210	3796.1			

Area of concentration	N	VERBAL		95% CONFIDENCE INTERVALS FOR MEANS	
		M	SE		
Languages	25	22.41	4.17	(-----*-----)	
Humanities	46	21.84	4.58	(-----*-----)	
Phys. Ed.	25	20.30	4.30	(-----*-----)	
Life Sci	43	18.97	3.84	(-----*-----)	
Science	28	17.57	3.50	(-----*-----)	
Maths	43	19.33	3.43	(-----*-----)	
				-----+-----+-----+-----+	
				17.5 20.0 22.5 25.0	

The relationship between experience in mathematics and utilization of modes of mental representation is more evident with respect to the areas of concentration (Table 6) than is evident among the four subsamples formed with respect to levels of experience in mathematics.

Table 6 indicates that as mathematics experience in mathematics courses increases, so too does the use of the verbal mode; it also suggests that as mathematics experience increases, the use of the visual mode decreases. The progression in each case, however, is not completely smooth, in that the subsample of science majors is out of step. These subjects, despite having studied slightly fewer mathematics courses than those in the subsample of mathematics majors, have even higher verbal scores and lower visual scores than do the mathematics majors.

The main difference between those science majors and mathematics majors suggests that science majors include mathematics and science experience, whereas mathematics majors do not, in general, have much science experience. Hence, although mathematics experience appears to be related to the ability to utilize different forms of mental representation, it is possible that such experience is not the only factor involved. That is, the application of mathematics to other subjects may also be of critical importance in the development of the ability to use the verbal mode of mental representation.

The study of science and the study of mathematics can be considered to be an intersection of two sets of topics. That is, science courses and mathematics courses sometimes contain identical content. For example, the study of vector forces is the same in both algebra and physics courses, and modern set theory is now an integral part of modern chemistry as well as of algebra. Each of the two disciplines, however, contains some distinct topics unique to the discipline. The fact that the subjects in the subsample of science majors were better able to utilize the verbal mode, and less able to utilize the visual mode of mental representation, than were the subjects in the subsample of mathematics majors, suggests that these discipline-specific topics are of importance.

Further research should be undertaken to find out more about these factors which are involved in science, yet not involved in mathematics. Research should also be undertaken to examine specific experiences in the study of different branches of mathematics; for example, pure mathematics, applied mathematics, and statistics, as well as in the application of mathematics to other areas of study.

IMPLICATIONS FOR THE FUTURE

This study has clear implications both for future research and for education. First, it gives a straightforward indication that differences do exist between the mental representation modes preferred by students enrolled in teacher education who have no mathematics experience, as compared to those who have even a small amount of experience in mathematics. Second, it implies that future research should concentrate on the differences in teaching which may arise from these differences in the utilization of all of the modes of mental representation.

That is, since we now know that student teachers who have no mathematics experience differ from the rest of the student population both in their use of the modes of mental representation and in their preferred knowledge accessing modes, the next question for research is that of the effect, if any, of this difference on the required teaching of mathematics which these individuals must conduct in the performance of their duties. As Ebenezer and Hay state (1995), "The entrance of the student into the teacher's realm of meaning is at the heart of most teaching." Further studies are necessary to determine whether the mathematics teaching by these non-mathematics teachers is effective, or whether more attention has to be paid to the training of prospective teachers who possess no experience in mathematics. There is, further, a question as to whether individuals who wish to enter the profession should be encouraged to have a broader university education than is currently the norm, including at least a few courses which contain mathematics in one form or another. This last is a political question, which can only be handled by all the faculties of education simultaneously.

One direct advantage of this study, then, is that student teachers can be made aware of the potential profile mismatches between teacher and students, and can learn to recognize and accommodate these differences. It may, further, be possible to introduce into the curriculum of both preservice and in-service courses, exercises which encourage the utilization of all the modes of mental representation, and hence which might assist teachers in developing their own abilities to use any mode in mental representation, if these can, indeed, be learned. The teachers who lack any exposure to mathematics in their post-secondary studies are of particular concern, since such teachers provide nearly all of the instruction in mathematics in the critical formative years of elementary school. Yet the potential for mismatches in profile between students and teachers appears particularly strong in the elementary grades, since many of the student-teachers in this study were not able to use particu-

lar modes of mental representation when asked to do so. Remedial courses for teachers should perhaps be highly practical, and closely tied to problem-solving.

Results from this study may also have implications concerning the mathematics curriculum at both the elementary and the secondary levels. Many of the students at the preservice level in the faculties of education possess a dislike for mathematics as a subject, a dislike developed in the elementary and secondary schools. This fact provides further support to the current drive for changes in the curriculum. The direction of change, however, should take into account two main points: first, the methods of teaching should provide more opportunities for the students to succeed, since so many of them do not succeed now; and second, the learning experiences of these students should encourage in them the utilizations of different forms of mental representation. Both factors might well be provided for at the same time, by offering more opportunities for hands-on manipulation, for problem-solving, for co-operative learning, for computer assisted instruction, and for concrete applications in mathematics courses, in contrast with the blackboard to pencil methods currently in use. This avenue of research appears promising, and has begun to be addressed. For example, a recent study of low-achieving grade nine students illustrated that use of computers in math classes can improve test results (Gurney, 1996). This is, however, only a beginning, and will require much more research before any firm conclusions can be reached.

This study has provided a starting point for an area of investigation on different rates of success in mathematics. It is clear from the data that students who possess no experience in mathematics do not have the same profile of use of the modes of mental representation as do those who have had experience. This is, however, only a starting point; more research is needed. In particular, this research does not address the question of whether the differences found are due to some deeper cause which, in itself, has encouraged students who prefer the visual mode of mental representation not to study mathematics in the first place.

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THE POTENTIALS AND PROBLEMS OF DIVERSITY IN CHINESE EDUCATION¹

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ABSTRACT. This paper begins with a discussion of the increasingly diverse and rapidly transforming structures and purposes of Chinese secondary schooling. We examine the diversity of secondary schools, including private and all-girl institutions, as a positive result of the changing needs of particular social groups, providing students and their parents choice, and alternative approaches in teaching and learning. We also focus upon the inequities that accompany such diversification, contrasting differences in schools' learning environments, teacher qualifications, and the alternative futures that schools provide to their students. Our information and conclusions are based on fieldwork conducted in 20 schools during the summer of 1996, as well as visits to other schools in 1995 and 1997.

RÉSUMÉ. Cet article débute par une analyse des structures et des objectifs de plus en plus divers et mouvants de l'enseignement secondaire en Chine. Les auteurs analysent la diversification des écoles secondaires et notamment des écoles privées et des établissements réservés aux filles, conséquence heureuse de l'évolution des besoins de groupes sociaux particuliers et de la nécessité d'offrir aux élèves et à leurs parents divers choix et approches en matière d'enseignement et d'apprentissage. Les auteurs se penchent également sur les inégalités résultant d'une telle diversification en soulignant les écarts qui existent sur le plan des milieux d'apprentissage, des compétences des enseignants et des perspectives d'avenir que les écoles offrent à leurs élèves. Les données et conclusions sont le résultat d'une étude menée dans 20 écoles au cours de l'été 1996, et de visites effectuées dans d'autres écoles en 1995 et 1997.

BACKGROUND TO THE RESEARCH PROJECT

Data for this paper come primarily from a one-year study, conducted in the summer of 1996, of social stratification and equality of educational opportunity in China.² In this project we examine how the economic and social reforms of China's "reform decade" have altered social class and identity, and the purposes and structures of schooling. New social demands linked to new social class identifications, based primarily upon

an individual's differential access to political, economic, and intellectual power, have formed the context for great diversity in Chinese education as well as increased inequality of educational opportunity. Understanding and documenting the ways in which schools are responding to pressures for the distribution, consolidation, and reproduction of political, economic, and intellectual powers is our primary research purpose.

Formal education has served as a powerful social sorting mechanism in post-Mao China. Public education has centered on funneling a small number of students into colleges and universities under centralized government control. Likewise, public education has been rigid, failing to adjust to China's rapidly changing economy. Simultaneously, the developing market economy has aroused great concern that schools meet the diverse needs of the economy at various levels. The development of the private economy and a market system under the framework of socialism have contributed to the establishment of a new hierarchy of power in the political system, as well as power in the market.

To understand the relationship and contribution of formal education to these processes, we studied 20 schools, including public key academic schools, regular non-key high schools, vocational schools, all-girls', and elite and ordinary private schools, in Beijing, Dalian, Shanghai, and Guangxi Autonomous Minority Nationality Region.³ Primarily, we were interested in understanding how these schools responded to the intellectual, economic, and political resources and interests of their students and those students' families. We investigated how schools were shaped as contexts in which the social backgrounds of students were reacted to and converted into academic achievement, perceptions of group identity, and educational and employment opportunities. We observed that market reforms, coupled with the reduced presence of state authority and resources in schools, were simultaneously altering social class formation and education in ways that consolidated the linkages between the two.

In most schools we visited, we talked with school administrators and teachers. Our conversations were focused around five categories of questions: 1) student outcome data and the number and social characteristics of the school's student body (including gender and ethnic make-up, educational and occupational history of parents, recruitment to the school); 2) the social characteristics, educational background, and organization of the teaching staff; 3) conceptions of the school's relative position and prestige in local and regional educational commu-

nities; 4) general and financial administration of the school and its linkages to enterprises or other social and economic units in the local community; and 5) the goals and content of the formal school mission and curriculum.

We also spent time at each school examining the school's formal curricula (statements of purpose, textbooks, teaching plans) and extra-curricular programs; filming and conducting open-ended interviews with teachers about their perceptions of the social purposes of schooling, the class background of their students, their teaching methods, and their own educational and occupational histories. The over-arching questions which guided these activities were: How have the economic and political reforms of the past decade altered schooling and class formation in China? How have these same reforms reshaped schooling in ways that reinforce new patterns of class transformation? How do socio-economic, ethnic, and gender characteristics of students interact with and shape learning conditions in different types of schools to restrict or enhance their access to political, economic, and intellectual power? How does this access ultimately determine who will shape the contours and interests of China's emerging civil society?

UNIFORMITY AND PROBLEMS IN PUBLIC EDUCATION

School policies of China's reform decade embodied a contest between expansion and diversification, reflecting the contradictory goal, evident in educational policy since 1949, of balancing equality of educational opportunity with advanced training for economic development (Ross, 1991). This contest was reinforced by two reforms in secondary education in 1985. The first reform redefined basic schooling by advocating the extension of compulsory education from six to nine years. While the task of making possible for all children the constitutionally-guaranteed right to a junior secondary school education remains daunting in rural and township areas, the great majority of urban students can finish junior secondary school and 80% move on to the senior secondary level.

The second reform of secondary schooling was its diversification at the senior high school level. This reform was designed to redress the narrow purpose of senior schools, which basically defined education as training students to pass the university entrance examination. As only a small number of students could be admitted into universities, the future and employability of the remainder of senior high school graduates had become a major issue. Insufficient vocational schooling, a legacy of the

Cultural Revolution policies to extend a common education to all students, was identified as the "weakest link" in Chinese education. In particular, the "under-development" of vocational training was blamed for a misalignment of schooling with the employment options of youths. By 1990 China had come close to meeting its goal of vocationalizing one-half of its senior secondary schools. Expanding employment opportunities in cities like Shanghai made vocationalization efforts so successful that 60% of senior secondary school pupils were enrolled in vocational programs.

However, despite success stories on the Eastern Coast, China's public education system, the biggest in the world, serving nearly 200 million students, is yet far from meeting rising demands for education. Although vocational and technical education has developed to divert students into nonacademic tracks, the goals of education for most schools remain that of preparing students for exams. School activities, teaching, programs, study areas, all have to be in line with guides and instructions from state authorities; and classrooms are big, usually with 45 to 70 students.

Uniformity and rigidity in the public school system have been exacerbated by inadequate state educational financial support. In recent years the average annual educational investment is 50 billion yuan, averaging 40 yuan per person, or US \$8.00 (Li Yixian, 1993), and more than 40% of rural students cannot attend secondary schools. Low funding renders schools poorly equipped, teachers under-qualified and under-paid, and school administrators short of funds to organize educational activities, much less innovate. Likewise, while the Compulsory Education Law instituted in 1986 states that education is free for students during the first nine years of schooling, in reality, students have to pay numerous fees, such as examination paper fees, school construction fees, water fees, after-school coaching fees, and on and on. Fees demanded by some schools exceed the annual income of rural parents. In poor rural areas, families may send only one child to school while the remaining children work to support their sibling in school. Despite the fact that the enrollment of school-age children is nearly universal in China, the graduation ratio is around 60% at grade nine nationally.

THE RISE OF PRIVATE SCHOOLS

Lack of seats in secondary schools, lack of state funding, irrelevance of the public school curriculum to (particularly rural) students' lives and employment opportunities, rigidity and control in the public sector

which inhibit reform, and restricted entrance to quality education (key schools) are among the reasons for the rise of private schools in large numbers in the 1990s. As parents, business leaders, and citizens see clearly that relying on the government will not solve the shortage of educational funding and resources, private education has become a major force in educational reform.

Government policies since the middle of the 1980s have advocated continued diversification and privatization of schooling; greater commitment to vocational training with business linkages; and further devolution of school funding and authority. In 1985, the government promulgated the *Decision of the Central Committee of the Chinese Communist Party on the Reform of the Education System* in which it was affirmed that local authorities should encourage and give guidance to the establishment of schools by state enterprises, organizations, and individuals. In 1987, the *Provisional Regulation on the Establishment of Schools by Societal Forces* contained concrete provisions for the establishment and management of non-governmental schools. The 1993 *Outline of Chinese Educational Reform and Development* further stated that the state adopts a policy of active encouragement, vigorous support, correct guidance, and enhanced management of schools established according to law by social organizations and individual citizens. Thus, state encouragement, as well as the centrality of schooling to social mobility, group identity, and economic development have set the stage for schools being inexorably incorporated into the commodifying hold of market socialism.

It has been widely written that economic reform has helped create the conditions and spaces within Chinese society for more autonomy and pluralism. The market economy injects competition into the employment system, calling for expertise at various levels. These demands, lack of space in the public education system, increasing competition for jobs, all have contributed to the rapid increase of private schools. In 1992 Guangzhou private schools and training classes enrolling 150,000 students were likened to "guerrilla" warriors, exploiting the local environment while providing whatever was needed by the society they served."Guangzhou private schools filled with students, adopting guerrilla strategies to be short, sharp, and quick" (World of Private Higher Education, 1993). As public schools and universities were awaiting answers from government officers, passing papers up and down the state bureaucracy, private school advertisements were appearing in newspapers and on the streets. Private schools set up foreign language, ac-

counting, fashion design, and interior decoration classes, whenever needs arose. Course schedules ranged from short to long, classes were offered day or night, all depending on the needs of clients. Schools promised to relinquish fees if students were dissatisfied with results. This guarantee of quality outcomes helped some administrators develop and eventually own their own school buildings and equipment.

Nationally, the expansion of private schooling has been breath-taking. By the end of 1993, there were roughly 20,000 non-governmental schools of different types (including kindergartens) across the country. Among them, some 700 were secondary schools enrolling a total of 130,000 students. Ten institutions of higher learning were accredited to award degrees (*xueli jiaoyu*) by the State Education Commission and duly registered; seven were regular universities enrolling 2,000 students (Zhu Kaixuan, 1994). By 1994, the State Education Commission reported 60,000 private, non-governmental schools and other types of unofficial educational institutions nationwide, including 16,800 kindergartens, 4,030 primary schools, 851 secondary schools, and more than 800 institutions of higher learning (Zhang Zhiyi, 1995). A year later, private schools absorbed 4% of all students in China (Kwong, 1996). Short-term training schools and other institutions for cultural and social learning reached 35,000 in number and enrolled 6.5 million people (Wang Minda, 1996). In 1997, the number of private schools and institutions has been estimated at 70,000, reaching around 7.5% of all public schools.

DIVERSITY AND PLURALITY: FORMS, TYPES, AND PURPOSE

Private schools have greatly diversified educational administration and provision.⁴ Private schools are established with public assistance, jointly by citizens, and solely by individuals. A new school system is also emerging in which public schools are evolving into non-governmental forms. Some private schools are self-financing; others absorb foreign capital in a cooperative effort. In management, non-governmental schools exercise the system of "putting the responsibility on the principals," or the system of "putting the responsibility on the principals under the leadership of the board of trustees." Such schools have the right to enroll students and charge fees on their own, hire teachers, adjust teaching plans, and establish curricula (Zhu Kaixuan, 1994).

Types of schools vary widely. So-called "elite" schools charge high tuition and fees (10,000-20,000 yuan annually) and respond to de-

mands for quality education. These are usually boarding schools which feature comfortable living arrangements, small class size, experienced teachers, English language and computer competency, and extracurricular activities. In contrast, less advantaged private secondary schools in townships and urban areas are designed mainly for students who fail to pass the entrance exam to get accepted into senior high schools. Students enroll in these schools in the hope of having a chance to pass the college entrance examination. In addition, many parents enroll their children in these schools so that the students have a place to stay out of trouble as they are still too young to join the work force. Tuition may range from 1,500 to 4,000 yuan annually. Better vocational-technical private schools generally offer two to three years, and charge a tuition of about 4,000 – 8,000 yuan a year. They provide specific technical skills to students who will be much more employable after graduation. Subjects of study include hotel management, tourism, accounting, secretarial work, commercial English, driving, cooking, and so on. Such schools are usually linked with government organizations or businesses for the students' employment upon graduation.

Rural private primary and secondary schools charge very low fees in contrast (about 300 to 700 yuan every year) and consequently suffer from inadequate teaching equipment and personnel. Nevertheless, such schools are expanding rapidly, and playing a very important role in providing basic education in rural areas. Rural private education is a natural outgrowth of the desperate state of public education: low quality, high fees, lack of teachers, and lack of access to higher levels of schooling. They are primarily established by villagers and parents who are fed up with the fees public schools are charging and who refuse to give up hope on their children's education. Struggling to survive, such schools nevertheless represent a hopeful alternative to public schools.

In recent years, prestigious public schools are also joining the trend to set up "private schools." They use their academic reputations and good facilities to attract students. These "private schools" follow the same curriculum and pace of key public schools, and their students participate in the same matriculation examinations. The establishment of such schools can enlarge enrollment by as much as 1,000 pupils. Parents are attracted to this kind of school, as they know that having one foot in a key school, public or "private," will increase their child's chance for university admission (Xue Jiangguo, 1995). In 1996, 12 such schools existed in Hangzhou, with over 20,000 students clamoring to participate in the selection examinations. One student was admitted for every

21 applicants, and prospective students ran to 4-5 schools in one week's time to sit for entrance examinations.

In short, there has been a great diversification in Chinese education, with private schools taking the lead in breaking the uniformity and rigidity of public schools. They are widely diverse in structure, type, client served, and in fact are a clear marker of how, in China, educational practice has far out-stripped educational policy and law.⁵ The reappearance of private education represents "two legs" of development in Chinese education, namely public and private existing side by side.

DIVERSITY, CLASS TRANSFORMATION, AND EQUITY

As we have noted above, diversity in Chinese education is, in part, a reflection of the diverse needs of different sectors of Chinese society. Schools are responding to the demands of different social groups who have tremendously different political, economic, and intellectual resources. The resulting diversity in schooling provides choice and stimulates educational reform. Yet it also reflects and enlarges gaps existing among different classes within Chinese society.

We argue that, increasingly, class identifications in China are based primarily upon an individual's access to political, economic, and intellectual power.⁶ Our usage of "social class" roughly refers to the characteristics commonly accepted to make up socio-economic status (SES). By the same token, we use the term "social stratification" in much the same way sociologists refer to structured inequality. That is, social stratification implies that inequality has been hardened or institutionalized, that there is a system of social relationships that determines social interests and power, and that people come to expect that individuals and groups with certain positions will be able to demand more influence and respect and accumulate a greater share of goods and services. Such inequality may or may not be accepted equally by a majority in the society, but it is recognized as "the way things are" (Kerbo, 1991). Having set these definitions, however, we must stress that concepts such as "class" and "social stratification" are problematic, shifting, and contingent in China, and subject to its specific political economy and on-going social, economic, and cultural transformations.

Class formation and transformation in China

Social classes before China's reform decade were defined according to Marxist-Leninist theories of class and class struggle (Lin, 1991). From

1949 to 1977, most Chinese citizens were categorized into five classes, namely, the "working class," "peasant class," "revolutionary cadres," "intellectuals," and "class enemies." Politically-defined criteria, such as property ownership and political affiliation before 1949, as well as demonstrated loyalty to the communist party, determined one's class category, political treatment, and social and economic well-being. How these class categories were abused in the service of political and personal violence during the Cultural Revolution is exhaustively chronicled in educational and social histories of the era when political, rather than economic or intellectual, power was the hallmark of social privilege (Cleverly, 1985; Hawkins, 1983; Lin, 1991).

After 1978, the equating of social with political power shifted as the needs of economic development, and the encouragement of private ownership, entrepreneurial spirit, and autonomy in the administration of private and public enterprises underscored the advantages of intellectual and economic power (Barnett & Clough, 1986; Kleinberg, 1990). The government reclassified social groups, designating former class enemies (estimated at from 10-15 percent of the Chinese population) as workers or peasants. As the sources of social status changed, whole groups of individuals experienced upward or downward social mobility (Dittmer, 1994; Goldman, 1992). Many rural workers benefited from the responsibility system in agricultural production, which entailed a significant transfer of economic decision-making power from the state to an increasingly autonomous peasantry (White, 1987). Prosperous rural families drew the attention of the media, prompting popular analyses of "the death of the peasant category." Former "class enemies" launched successful enterprises, drawing upon personal relationships and managerial skills they had forged before 1949. University professors found high-paying consulting work outside academe. Journalists and scholars began to refer to a "new middle class" of industrial and commercial entrepreneurs, whose wealth and risk-taking captured the public imagination.

In contrast, workers in deficit-prone, state-run enterprises lost the label of political rectitude and their job security. As powerful government bureaucrats exchanged political favors for economic investments, and the state withdrew its welfare safety net from the most vulnerable members of Chinese society, public and private institutions alike became the breeding grounds for corruption. These concurrent forces eventually motivated some of the fiercest voices of the democracy movement (Rosenbaum, 1992).

The social tensions of the 1980s have continued unabated, rendering people's understanding of their relationships to culture, the state, and the economy increasingly complex and open to public scrutiny (Whyte, 1992; Davis & Harrell, 1993). The separation of political from economic power, as well as the depoliticization of daily life, has been credited for simultaneously enlarging the space for popular initiative and accelerating "the public hunger for autonomous and protected social lives" (Whyte, 1992). In societies characterized by rapidly changing distinctions between public and private identity, class boundaries are remarkably fluid. Nevertheless, we draw tentative conclusions from our study about emerging social groups and (to foreshadow our discussion of secondary schooling) the extent to which these groups rely on and influence formal education.

In brief, a newly rich class includes a tiny, diverse slice of the Chinese population, consisting of corporate managers, real estate and stock market investors, private entrepreneurs, and public figures such as entertainers. Members of this group may or may not be highly educated, although their economic power can buy the means to elite private education (or be invested in proprietary schools), as well as provide indirect access to or membership in a second group, the political power elite. Members of the political power elite rely on government office and connections to secure economic power and access to elite schools. A third group, which we refer to as the latent middle class, is comprised of urban business owners and highly-skilled professionals, consultants, and mid-level government officers whose influence resides in intellectual and economic, rather than political power. We argue that the interests of this group provide the driving force behind current educational innovation and experimentation. A fourth group, the professional salaried class, consists of mid-level state workers and professionals such as teachers. Often highly educated, members of this group lack economic and political power, and rising tuition costs and supplementary fees associated with public and private schools bar all but their most academically talented children from attending elite schools. Members of a fifth intermediate group of semi-skilled workers in cities and suburbs experience some economic stability but are denied access to the means of political and intellectual power, as are members of a sixth group of rural peasants and contract laborers. Like a seventh group of migrating populations and the rural poor, who reside at the margins of economic development, peasants and laborers become the subjects of education only as recipients of state compensatory educational resources.

Market reforms alter the sources of group identity, as people define and redefine themselves in particular social contexts. From this perspective, we see schools as contested institutions in which relationships among class background, educational opportunity, and economic advantage often have interrelated impacts on how Chinese schools have become stratified by differential access to the sources of intellectual, economic, and political power.

Power and diversity: Who has access to what schools

Access to the many types of schools existing in today's China depends on the power parents possess. We illustrate here with an analysis of key public, elite private, all-girls', and public ordinary and vocational secondary schools.

Key public secondary schools in theory uphold through their admission standards a kind of meritocracy, e.g., they are based on examination scores. Key schools are supposedly open to all who have demonstrated academic excellence. However, our visits to key schools show that over 80% of the student bodies comes from government official and intellectual family backgrounds. In the past few years, all key primary and junior secondary schools were ordered to abandon their key school designation; however in teaching quality and equipment, they remain far superior to other schools. A concomitant policy also requires that students attend schools in their residential districts. As key schools are usually located in residential areas for government officials, children from families of government officials are not affected at all. They thus possess a decisive entrance advantage. In addition, children of government officials sometimes gain entrance into key schools not through academic performance but "back doors," or their parents' social connections. The second group of students who benefit from key schools come from intellectual family backgrounds. These children possess intellectual capital which helps them excel. As the children of government officials and intellectuals are the main beneficiaries of the key school system, the policies adopted in the past two decades have favored key schools. Today, these schools still have the privilege of transferring good teachers from other schools to their own. This practice ensures that key school students receive the "best" education possible (Lin, in press), particularly as excellence is equated with successful entrance into high-quality colleges and universities.

Finally, economic power is also playing a key role in access to elite key schools, which take advantage of the social demand to admit students

with lower test results and school grades if parents can bring in business to the school. In some schools, 2-4% of students gained entrance because their parents could bring in business for the school or pay high fees. The fees they pay range from 6,000 to 12,000 yuan a year. Parents also use donations to get favorable treatment for their own child (Wu Jiqing, 1994). Schools with good reputations thus collect a huge amount of fees, causing scholars to complain that justice has failed as money and power provide choices for a small percentage of people, causing widespread dissatisfaction among the majority of parents (Yang Minqing, 1996).

This purposefully stratified nature of public schooling has helped perpetuate the political, economic, and intellectual power of parents based on their social class; admission to key schools means the possibility of attending an institution of higher education or employment upon graduation from high school. In Shanghai in a nationally-recognized key school, 80% of students (50% of whom are female) come from political power elite or intellectual families. All will attend college (nearly three-quarters at key universities). They enjoy fully-equipped science and computer labs (with IBM 486 computers for each student) and ballet and film studios. Their teachers' annual salaries range from 12,000 to 20,000 yuan (compared to an average scale of 5,000 to 7,000 yuan). To support such abundance the school has established an affiliated private school with a 3,000 yuan tuition. Students who fail to gain entrance into elite key schools line up to attend.

As key schools allow government bureaucrats and intellectuals to reproduce their political and intellectual power, elite private schools serve the newly-affluent "middle class" families whose children have either failed to gain entrance into a key school or who seek more "progressive" or more socially-exclusive alternatives to state education. Private schools have emerged as the new symbol of secondary education's exchange value. As noted previously, by 1996 at least 60,000 of China's 960,000 schools were privately owned, including 3,159 full-time primary and secondary schools. About 10% of them were elite private schools.

Elite private schools are open to children whose parents are mainly newly risen entrepreneurs, high-ranking executives of joint, cooperative, or foreign-owned ventures, personnel working abroad, compatriots of Hong Kong, Macao, or Taiwan, the tiny segment of the Chinese people who "became rich first," and intellectuals or government func-

tionaries who care about fostering talent. Of 150 parents of Beijing's Jinghua Elementary School, 20% were government functionaries; 30% were managers of enterprises; 20% were high-ranking employees of foreign enterprises, 15% were personnel of township enterprises; 10% were personnel working abroad; and 5% were individual business people (Zhang Zhiyi, 1995).

The most exclusive private school we visited for this study charged an annual fee of 20,000 yuan for tuition, room, and board (equivalent to the salaries of those highly paid key school teachers referred to above). Moreover, parents have to pay a one-time school construction fee of 20,000 – 50,000 yuan. Some elite private schools in Southern China also demanded more than a quarter million yuan for the “school saving's fund,” with the school using the interest to maintain the daily operation of the school, and the principal amount returned to parents upon the child's graduation. For students who have failed to achieve high enough scores to enter a public key school, this private school represented a “second best chance” to attend college.

Private school administrators do not have the advantage of admitting the best students in their schools, yet they have a strong financial base from which to offer alternative curricula, including orchestra, intensive training in English, computer science, and the arts. They also expand boarding facilities, using custodial provisions to attract and accommodate busy professional or divorced parents. They hire qualified contract teachers with high salaries, and seek to develop a “whole dragon” system of schooling that provides a route to social mobility (from primary school through college) entirely outside the state-run educational system.

We need to stress that the quality and intentions of private schools vary tremendously, with the crassest sort of proprietary schools well-represented. However, at their best, private schools, much more than their public school counterparts, provide sites of innovation in: 1) approaches to teaching; 2) recognition of students' rights; 3) development of artistic technique and creativity; and 4) a depoliticized curriculum. Private schools let talented educators, freed from the constraints of the state teaching outline, put their educational philosophies into practice and make full use of the untapped talents of veteran teachers who have had to retire from the public school system by the age of 50 or 55.

We must also stress that some private schools do also open doors to ordinary citizens in urban and rural areas, charging limited fees and

tuition. Thus, such private schools are not uniformly contributing to increasing levels of educational inequality, precisely because they fill educational gaps left by a state unable or unwilling to provide sufficient schooling for increased (and increasingly diverse) educational demands by the public. Private schools we investigated in Guangxi province were established by rural parents to save on educational expenses. Their local public schools, with add-on fees for textbooks, examination papers, and teachers' bonuses were simply too expensive for their children to attend. Likewise, philanthropic organizations, some organized by wealthy foreign donors, run thousands of schools for China's least advantaged – the children of migrating and isolated minority populations.

Private education development in China is driven, as it is worldwide, not only by the need for increasingly specialized labor, but also by complex interactions between state and class interests. Chinese schools, once tightly linked to national interests, have been gradually reshaped to reflect a combination of interests derived from powerful social groups and "market" forces. Social groups and individuals have usurped social functions of education previously monopolized by the state.

Girl's schools reflect most distinctively the diversity of Chinese school experiences. While they appear to be opening in cities mostly for the daughters of managers, small business owners and members of what we have termed the "latent middle class" who have a fixed job in state agencies but make much more from kickbacks or moonlighting, they also serve poor rural girls who would otherwise have no access to secondary schooling. We visited three all-girls' schools for this project and were informed there were more than 100 all-girl schools and colleges in the country. We were struck by their rapid development, a phenomenon that remains undocumented in the literature. We were also impressed by the diverse constituencies these new schools serve. Single-sex schools for girls have appeared in China in cities as well as in the countryside, in developed as well as in under-developed areas of the country. Offering public, private, academic, and vocational options for girls from advantaged and poor and minority families, the missions and curricula of girls' schools vary dramatically.

The three girls' schools we visited included a key public school, and one public and one private vocational school. Vastly different purposes and ideals motivated education in each of these schools. For example, the principal of the private all-girls' vocational school greatly impressed us, not only because of her profound and proactive philosophical thinking regarding gender and learning, but also because of her skillful manage-

ment of the school. Instead of teaching students "girls' stuff," as administrators and teachers in some girls' schools unabashedly report doing, this school's required curriculum included martial arts, wrestling, driving, computer literacy, and English – for the purpose of "opening as many routes of employment to young women as possible." The school admits girls who have been screened out by the admission exam to senior high schools. Their parents pay a medium-high fee (8000 yuan each year) for their girls to study vocational as well as basic academic subjects, in case they hope to go on to universities. The formal and informal curricula were explicitly planned to help girls be confident in their abilities and be more employable in the very competitive job market of today's China – while also providing them the option of heading toward higher education.

The public key girls' school shared all of the characteristics of key schools reported above. In addition, it adopted different teaching methods that administrators and teachers felt were "in accordance with girls' characteristics in learning." The similarity of these methods with those experimented with in North America were striking, and worthy of further comparative research (Ross, 1993b). The admission rate of graduates from this girls key public school to universities is about 98%. In contrast, the urban public vocational all-girls' school we visited defined its approach to girls' education as cultivating the "special characteristics of Eastern women." We watched its senior secondary school pupils study cosmetology, fashion, and tourism – making beds and pouring drinks with grace and deliberation. The students are trained for popular (and very gender-stereotyped) jobs in the rising service and foreign trade sector in the country. Our disparate experiences in these schools raised questions regarding how class and gender intersect to make schools gateways or barriers to girls' learning.

In public ordinary and vocational schools, students are mainly from working class or peasant family backgrounds. Less than 3% of graduates from a suburban non-key high school in Beijing we visited will attend college. The remainder (all of whom come from semi-skilled worker and rural working class backgrounds) will be employed in local working class or semi-skilled jobs. The school scrapes by, has tried and failed to enter the market to generate money to raise teacher salaries and buy laboratory equipment (there is none).

Vocational and general ordinary schools, be they urban or rural, have much less political, intellectual, and economic "capital" upon which to draw. They are increasingly disadvantaged as reforms of the last decade

accelerate, perhaps to the point that students in these schools (and their parents) will question their efficacy. We anticipate that the schools we investigate in phase two of this project, which are located in China's Central and Western economic/geographical regions, will struggle most in gaining access to resources, as a result of poorer economic conditions linked to state policies that emphasize concentrated economic development in China's Eastern Coastal Region.

DISCUSSION AND CONCLUSION

In conclusion, how the patterns above influence access to and processes within schools vary widely across social class, with access to the sources of economic, intellectual, and political power highly constrained for lower-working class students. What must emerge from this scenario – increasingly disparate educational purposes and outcomes tightly related to social class background – poses a serious challenge to the future of equality of educational opportunity in China.

Our research informs us that education policy and unintended consequences of economic reform and cultural openness have coincided to increase stratification of secondary schools. Market reforms, coupled with the reduced presence of state authority and resources in schools, are simultaneously altering social class formation and secondary education in ways that consolidate the linkages between the two. As explicitly stratified schools are required to marshal an ever-increasing proportion of funding from local resources, they become more tightly linked to the needs and desires of their constituencies. Prestigious key and private schools, recognized for their ability to prepare carefully selected students for college-level training, are securely positioned to take advantage of local material and cultural resources, much of which comes from the social and professional networks of students' parents. Elite key schools are able to convert the social status of their students into academic attainment and achievement, which, in turn, consolidates graduates' social status and confers further prestige on the schools.

Our fieldwork indicated how regularly extracurricular activities were used by schools as markers (to parents and the community) of exclusivity, prestige, and unique educational mission. Elite public and private schools are proud of this advantage. Courses in computer science and foreign languages have become the two current measures of quality teaching and school resources. In fact, we believe instruction in these areas provides a fairly reliable marker, in the senior secondary school

context, of the richness of a school's material resources, openness to reform in teaching methods, quality of teacher preparation, and ability to prepare students for college entrance examinations.

While elite private schools are considered the second best option for guaranteeing social mobility, they are also the most innovative institutions in the Chinese system. Vocational and rural schools, having much less political, intellectual, and economic "capital" upon which to draw, are increasingly disadvantaged as reforms of the last decade accelerate, perhaps to the point that students in these schools (and their parents) will question the efficacy of education. Girls' education is an interesting development which has important implications for gender equality and improvement of learning and self-perception for girls.

As the establishment and rapid increase of private schools indicates the trend that education in China is increasingly seen as a private good. Yet, seen as attempts by individuals to mobilize local resources, private schools are also a part of China's nascent civil society, and may offer a radical form of equity that is neither economic nor political but cultural, "granting different groups the right to have their own stories told in the space reserved for public discourse, a space that has traditionally been restricted" (Feinberg, 1993, p. 168). The multiple roles played by private schools illustrate that the consequences of simultaneously stratifying and loosening state control of schooling. Pilot interviews with educators and parents indicate grave concerns regarding the potential for social unrest inherent in China's redistribution of economic and social power. We believe that continued commitment by the state to equality of educational opportunity is crucial in this context. Furthermore, we contend that if such a commitment is to be realized in practice, it must first be based upon an understanding of how educational opportunity is being reconstructed within China's schools. Only then can policy makers make "a careful examination of how to redistribute the costs and benefits of education so that there are net gains for the disadvantaged populations, especially rural and poor" (Tsang, 1994, p.305).

Such concerns will guide phase two of our study in which we hope to reveal the overlapping, inter-related forces and systems that shape educational and social stratification, particularly gender, geographical diversity, and to a lesser extent ethnicity. In this era of reform, we are convinced a meaningful framework for analyzing educational and social stratification must be multi-dimensional and grounded in data collected from a diverse range of schools.

NOTES

1. This research was made possible with funding from the Spencer Foundation and the Social Science and Humanities Research Council in Canada.
2. Our conclusions represent the first phase of a three-year research project, in which we will expand our study to include schools in central and western China.
3. In 1995 and 1997, Jing Lin also visited nearly two dozen schools in different places in China.
4. For example, in Shandong province in 1994, of the 1636 private schools of all kinds, 712 were established by private citizens, comprising 43.6%, 217 by social organizations (13.3%), 179 by government agencies and military organizations (11%), 68 by democratic parties (4.2%), 456 by business or collectively-owned businesses (27.9%), 4 by foreign and China corporations (Liu Fengshan, 1995).
5. Shen Yang city in Liaoning province in Northeast China provides a good example. By the end of 1995, the city had 66 private schools and non-governmental schools, including 14 primary schools, 5 combined primary and junior secondary schools, 36 junior secondary schools, 2 "complete" six-year secondary schools, 3 "marshal arts" (gongfu) schools, 1 art school, and 5 senior high schools. Nineteen of these schools were set up by private citizens, 33 were owned by the state but managed by private individuals, 8 were established by corporations, 4 were established by private individuals but supported by the government, and 2 were jointly owned by China and foreign corporations (Guo Ge, 1996).
6. In our larger research project, we examine patterns of social and educational inequality, and access to political, economic, and intellectual power, across the domains of geography, ethnic membership, and gender.

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INTEGRATION OF COMPUTERS INTO THE CURRICULUM: HOW TEACHERS MAY HINDER STUDENTS' USE OF COMPUTERS

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ABSTRACT. Research has shown that although the integration of computers into the curriculum by teachers remains minimal, students have consistently demonstrated a positive attitude toward computers. In this paper, we report a study that examines the secondary school students' use of computers for learning. We have focused on a high school in Nova Scotia. Based on the data we collected from surveying and interviewing both students and teachers, we identified the limited use of computers for learning by students, the dependency of students on teachers for integration, the constraints of teachers on students, and the reasons for the constraints of teachers on students in terms of teachers' practical difficulties and attitudes toward computers. Based on the above findings, we have discussed implications for the planning and implementation of integrating computers into the school curriculum.

RÉSUMÉ. Les recherches démontrent que si l'intégration des ordinateurs dans les programmes d'études par les enseignants reste un phénomène marginal, les étudiants ont toujours eu une attitude favorable à l'égard des ordinateurs. Dans cet article, nous rendons compte d'une étude portant sur l'utilisation de l'ordinateur à des fins d'apprentissage par les élèves du secondaire. Nous nous sommes concentrés sur le cas d'une école secondaire de Nouvelle-Écosse. En nous fondant sur les données recueillies au moyen de sondages et d'entrevues auprès d'élèves et d'enseignants, nous avons constaté que les élèves utilisent peu l'ordinateur à des fins d'apprentissage, qu'ils doivent s'en remettre aux enseignants pour ce qui est de l'intégration de l'informatique dans les programmes et subir les contraintes que leurs professeurs leur imposent du fait des difficultés pratiques qu'ils éprouvent et de leurs attitudes à l'égard des ordinateurs. Nous avons examiné ce que ces résultats sous-entendent pour la planification et l'intégration de l'informatique dans les programmes scolaires.

Various studies indicate that, although the availability of computers in schools has been substantially increased (Council of Ministers of Education, 1996; Goodson, Mangan, & Rhea, 1991), the use of computers

for teaching and learning by integrating computers into the curriculum remains minimal (Alberta Department of Education, 1993; Becker, 1992; Collis, 1988; Reinen & Plomp, 1993). For example, the ratio of students to computers on January 1 of 1993 in Alberta was found to have reached 10.6:1. Although 68% of respondents rated the availability of computers as satisfactory or better, the average access for most students was under two and a half hours per week of time directly related to curriculum objectives. This finding seems typical internationally. The International Association for the Evaluation of Educational Achievements (IEA) conducted a survey on the use of computers in schools from 1987 to 1990 in 18 countries (Pelgrum & Plomp, 1993). It was found that in most countries the integration of computers into school subjects was still being initiated by small groups of teachers, although there was a tendency that the higher the grade level the more frequently computers were integrated into school subjects.

Since the early 1990s, more schools have gained access to the internet. *SchoolNet*, a Canadian national project launched in September, 1993, intends to link all of Canada's 16,000 schools to the internet as quickly as possible. Currently, at least one third of schools are already on-line. Similar initiatives are under way in the United States (Gore, 1995). Again, in schools the increased availability of the latest technology, including the internet, has not led naturally to its extensive integration into the curriculum. For example, Honey and McMillan (1993) found that only a few teachers have used the internet for instructional purposes, and Honey and Henriquez (1993) found that even among a technologically sophisticated group of practitioners, the use of the internet other than for sending and receiving electronic mails was minimal.

On the other hand, research suggests that students do not demonstrate the same hesitation as teachers with regard to integrating computers. Students tend to view technology as a natural part of their lives in school, are not as reluctant as adults to experiment, and can develop the requisite skills quickly (Curtin, Cochrane, Avila, Adams, Kasper, & Wubben, 1994; Doornekamp, 1992; Dwyer, 1994). Further, contrary to many fears teachers have about computer use in their classrooms, students using computers in their courses are not socially isolated, and tend to collaborate with each other (Dwyer, 1994).

Given the above discrepancy between the reality of minimal integration of computers by teachers and students and the positive attitude and natural tendency of students to integrate computers, it would be interesting to know if and how teachers may hinder students' integration of

computers in learning. Research into the integration of computers into the curriculum has focused primarily on teachers, by such means as teacher training and technical support for teachers, but little attention has been given to how students integrate computers.

Alternative approaches to educational evaluation emphasize that voices from all stakeholders must be heard and that communication among stakeholders needs to be maximized so that consensus can be reached (Guba & Lincoln, 1989). Because students are directly affected by teachers' integration of computers into the curriculum, a study focusing on students would broaden our understanding about computer integration, and would shed light on the impact of teachers on student learning through the use of computers.

This paper reports on a case study conducted at a high school in Nova Scotia which focused on how teachers may hinder students' integration of computers into their learning. In it, we revealed the dependency of students on teachers for integration, the constraints teachers place on students, and the reasons for these constraints.

In the context of our investigation, integrating computers into the curriculum referred to the use of computers for course work or any school teaching and learning-related activities by both teachers or students. Thus integration may include such activities as word processing for assignments, the use of internet searches for course projects, using a computer simulation for class discussion, and so on. Next in this paper, we will describe the research methodology we followed, the results we found, and the implications of the findings regarding the integration of computers into the curriculum.

METHODS

The school

This study was conducted at a large rural high school in Nova Scotia. This school is the main secondary school in its district. A total of approximately 1200 students in Grades 9 to 12 from a number of different cultural groups attend the school. Although employment opportunities in the area are created mainly by the university and the regional hospital, there is also a great deal of employment stemming from farming and fishing. As a result, students of many distinct backgrounds and socio-economic groups are represented. The administration of the school consists of a principal and four vice-principals, each of whom is responsible for one grade.

Although the school is located in a rural area, its computer facilities are typical compared to many schools, urban or rural, in the country. By 1994, the school had only one computer lab, equipped with 24 recently up-graded Novell-networked 386 computers. In early 1995, the school received a grant from the federal government to establish another computer lab of 20 networked computers with multimedia and internet connections. A third computer lab is also being pursued. The study reported in this paper took place in early 1995, immediately after the new internet computer lab was established and became functional.

Data collection techniques

Survey. We developed a student survey questionnaire (see the appendix), which included questions related to students' use of computers for learning, to the difficulties students experienced, and to the background information (optional). In order to ensure the validity of the survey questions, we adapted the relevant questions from the teacher survey questionnaire used by British Columbia's 1988 IEA Computer in Education Study that was a part of a large scale international study involving 18 countries (Pelgrum & Plomp, 1993). New questions related to multimedia and internet were added. The draft survey questionnaire was read by a school vice-principal and by a student to evaluate the relevance and clarity of the questions. Some revisions to the questions were made based on their feedback. After the survey, we calculated the internal consistency reliability of various scales within the questionnaire. For the "types of computer uses scale" Cronbach's alpha was .89; for the "reasons for computer uses scale" it was .77; and for the "difficulties of computer uses scale" it was .92.

With the number of students in the school exceeding 1200, the high cost to administer the questionnaires to all of them required the use of a quasi-random sampling strategy. We first arbitrarily selected a date for the administration of the questionnaire and all the classes scheduled for the last period (8th period) of that day were selected as potential classes for our survey. The teachers of those classes were approached and asked if they would be willing to administer a survey to their students. All but one agreed to participate. Represented among the classes, which covered a broad range of subjects, were students of various ability levels (general, academic, honours, and special education) from Grades 9 through 12. Fourteen classes (275 students) completed survey questionnaires and all the questionnaires were collected by the teachers at the end of the designated period.

Interview

We followed the survey study and the analysis of the survey results with a series of interviews in order to better interpret the survey results. We interviewed two vice-principals, six teachers, and six students. The teachers who were selected for interviewing were representative of most of the subjects taught at the school. One of the vice-principals selected the students who would be interviewed. The selection criteria used by the vice-principal included a representation of grade levels, representation of students' learning abilities, and a representation of ethnic background. Before the interviews took place, a letter of consent was signed by both the students who were interviewed and their parents.

Some interview questions were drawn from the survey questionnaires, and some questions were developed according to the need for further information about the extent of each interview subject's computer use in school. Depending on each interviewee's responses, additional questions were formed spontaneously during the interview by the interviewer. All the interviews were audio-recorded so that exact transcripts could be made for analysis.

Data analysis

We conducted both qualitative and quantitative data analyses. Descriptive statistical and cross-tabulation analyses were performed on the survey data to identify patterns of dependency of students on teachers for computer use. In order to analyse the interview data, we used the constant comparison technique (Glaser & Strauss, 1967). More specifically, we used the following procedures: (a) read all the interview transcripts to get a general sense of the data; (b) read the interview transcripts again to generate topics from the data segments; (c) made a list of topics generated and compared the topics for duplicating and overlapping meanings; (d) classified those topics into categories that are directly related to the purposes of this study. To add to the cogency of the results, we inter-referenced the presentation of the results from our statistical and interview analyses.

RESULTS

Dependency of students on teachers for computer integration

All but two of the students who completed the survey questionnaire had used computers. Table 1 reports the frequency with which students used specific types of computer applications. It can be seen that the

percentages of students who were using computers for their learning were generally low with 17.6% for word-processing every week as the highest. Only 4.4% of students were using computers every week for internet navigation, 3.3% for computer-assisted labs, 1.8% for computerised tutorials, and 2.6% for solving problems using the internet .

Table 2 lists the reasons cited by the students for their limited computer use. It indicates that 72.5% of the students who responded said that they had used computers because of the course requirement introduced by their teachers. Personal interest and exploration also played an important role: 74% of students surveyed said that personal interest was one of the main reasons for their use of computers in school. Although motivation by peers contributed somewhat to students' use of computers, it was not as large a factor as a teacher's course requirement or personal interest. Similarly, 26% of students indicated that their computer use was the direct result of a requirement by their parents.

TABLE 1. Frequency with which students have used specific types of computer applications (N=273)

COMPUTER APPLICATION	FREQUENCY*		
	Every Week(%)	Most Weeks (%)	Some Weeks (%)
Wordprocessing	17.6	7.3	55.3
Spreadsheets	11.0	3.3	40.3
Database	4.0	3.7	45.1
Other Computer Assisted Organization	3.7	2.2	6.6
Drills and Practice	6.2	5.5	35.9
Tutorial	1.8	2.2	34.8
Simulation	2.9	6.2	27.1
Labs	3.3	4.8	27.5
Problem Solving	4.8	3.7	33.7
Multimedia	10.3	5.1	46.9
Recreational Games	17.2	10.6	48.7
Educational Games	7.0	9.9	41.0
Other CAI	2.2	0.4	6.6
Communications	3.7	3.3	24.2
Internet Navigation	4.4	4.8	39.6
Problem Solving	2.6	3.7	27.8

* Not necessarily sum to 100% because of blanks and invalid responses.

Besides students' personal interests and exploration, the fact that such a high percentage of students (72.5%) indicated that the teachers' course requirement was one of the main reasons for their computer use signifies that the computer use of most students is dependent upon teachers. In our cross-tabulation analysis, we found that the teacher's

TABLE 2. Reasons for computer use by students in percentage (N=273)

REASON	Very (%)	APPLICABILITY*	
		Somewhat (%)	Not Applicable (%)
Personal interest/exploration	37.4	36.6	5.1
Required by teachers	27.1	45.4	13.2
Required by parents	5.1	20.9	44.7
Motivated by friends	11.7	34.1	26.0
Other reasons	6.2	3.3	2.2

* Not necessarily sum to 100% because of blanks and invalid responses.

course requirement of computer use had a significant association with the frequency of the following aspects of student computer use: taking computer courses ($\chi^2=7.601$, $df=2$, $N=229$, $p<.05$), accessing the new computer lab ($\chi^2=6.972$, $df=2$, $N=233$, $p<.05$), accessing the older computer lab ($\chi^2=7.238$, $df=2$, $N=233$, $p<.05$), and word processing ($\chi^2=9.481$, $df=2$, $N=60$, $p<.05$).

Although we found, from our interview of teachers, that some of them actively sought to integrate computers into the curriculum due to their perception that it would make their teaching and student learning more efficient as well as to a certain degree of their curiosity and desire to learn more about computers, even more teachers had never used or required students to use computers in their courses due to their lack of personal interest in learning about computers and due to their perception that computer integration was unnecessary for student learning.

This disparity among levels of teachers' perceptions of computer integration appeared to have direct consequences on student computer usage. Students whose teachers did not demonstrate an interest in computers tended to feel left out. As one Grade 11 student noted, "I mean, I've been to the lab [the new lab], but just in off periods. I never went up there with a teacher. . . I don't really have much use for it myself."

Table 3 lists the difficulties students have experienced. It shows that there is a split with regard to teachers' support: 41% of students indicated that the lack of teacher support was very or somewhat applicable, and another 40% of students indicated that the lack of teacher support was not a problem. Many of the difficulties listed in Table 4 are directly and indirectly related to teachers' support. For example, in terms of accessibility, students indicated in our interview that during the free periods when no teachers were scheduled in the internet computer lab, the room was locked. Even when teachers were in the room, they were reluctant to let other students use the spare machines because they did

not want to take responsibility for any problems that might arise. One Grade 9 student, when asked about the accessibility to the new lab, said "I find it really hard to get in. I would like to go to the lab more in my free time."

TABLE 3. Difficulties that students have experienced (N=273)

DIFFICULTY	Very (%)	APPLICABILITY*	
		Somewhat (%)	Not Applicable (%)
Lack of Peripherals	14.7	21.6	43.6
Limited Access	16.8	28.6	40.3
Hardware Breaks Down Regularly	7.7	16.5	52.0
Computers Are Old And Slow	11.7	16.1	49.5
Other Problems With Hardware	5.1	2.9	5.5
Limited Software	13.2	36.6	30.8
Software Too Difficult	11.4	36.6	31.9
Other Software Difficulties	3.3	2.9	4.4
Limited Computer Knowledge	38.5	48.1	11.2
Not Enough Help	17.9	42.1	22.0
Other Technical Support Difficulties	2.6	3.3	3.7
Limited Teacher Support	8.4	32.6	39.9
Too Busy With School Work	16.1	41.4	26.7
Other School and Family Context Difficulties	3.3	3.3	4.4

* Not necessarily sum to 100% because of blanks and invalid responses.

Constraints of teachers in their computer background and attitude

The lack of teachers' support for student integration of computers into the curriculum is certainly related to teachers' computer backgrounds and their attitude toward computers. Whether individually or as a group, there is no question that the levels of teacher ability and experience at the high school were impressive. Most of the teachers had many years of experience, as well as excellent academic qualifications. Many teachers at the school possess Master's degrees. However, most of the teachers did not have a particularly strong computer background and the majority of them we interviewed claimed that their computer knowledge was at the novice level. Some teachers did not even have such basic skills as typing. For example, a Social Studies teacher, when interviewed, said:

My biggest downfall is that I can't type. I don't have the time to actually sit down and teach myself to type or take a typing course, so [when] it comes down to needing a test for the next day I can do it quicker by hand than anything else.

Teachers' faith in computers is another constraint. Even the relatively advanced computer users at the school did not necessarily maintain a high degree of confidence in computers. For example, the math and computer teacher, generally perceived by his colleagues to be an "expert", commented that, "This technology is so new to me. Math is two thousand years old and I've been teaching it for twenty five. This stuff is about one year old and I've been teaching it for one year."

Some constraints contributing to the lack of teachers' support were related to the availability of computer hardware and software. For example, when interviewed about the potential of computer use in the curriculum, one teacher, who had a great deal of experience with computers, replied:

With my knowledge and background and resources I would have trouble finding a use for the computer lab for my math 541. Through lack of software, lack of hardware, lack of advanced equipment [computer screen projector], I just couldn't right now make use of it. I expect a lot of other teachers are in the same position. I don't know. The problem will be finding suitable software. And that takes a lot of funding. If I was in charge and had an infinite budget I would say if the room cost \$100,000, I would establish a fund for \$20,000 worth of software each year to keep the lab up to date. They don't usually do that. They put the hardware in there and then you scrounge for software. There is a lot of work to be done on what is good and bad software, and until then it is not going to be properly made use of.

Other constraints contributing to the lack of teachers' support to students' integration of computers are related to the lack of technical support available to teachers themselves. Because of their own limited computer knowledge and skills, they expected the school to provide them with the necessary technical support and assistance with computer hardware and software. Those teachers we interviewed who had never used computers in the school clearly indicated that this general lack of support systems contributed to their overall reluctance to use or require students to use computers. Some teachers were able to have student teachers working on their practicum assist them in the lab. However, many other teachers seemed uncomfortable taking their classes to the new lab without having a computer technician present. One teacher, when asked if he thought computers could be efficiently used, commented, "If it was just me with my class I don't think much would have been accomplished."

Teachers' attitudes toward computers also create another constraint, particularly when internet is concerned. Teachers were cautious to

identify the benefits resulting from the use of computers and the internet. For example, although almost every teacher we interviewed acknowledged the internet to be a potential well-spring of useful information, they also decried the fact that there was a lot of "garbage" that had to be sifted through in order to weed out the valuable material. Teachers were aware of the vast amount of useless information on the internet and many stated that some way should be developed to filter out as much of it as possible. They believed that students tend to believe what they saw on the computer as well as on the television. Thus, the integration of technology into the curriculum had to be selective, because not everything provided by the technology was pedagogically useful. Further, individuals planning to use the internet had to know how to evaluate everything they found, and be able to scrutinize information to establish its worth. For the most part, students had never had to do that for themselves; it was therefore a new skill that they needed to be taught before the full potential of the internet could be realized. One teacher, when asked about the usefulness of materials on the internet, answered:

It's going to be an excellent tool, but, like everything else, we have to develop our brains and our thinking and we have to use research. You know that saying "Garbage in, garbage out"? Well, if it is garbage into the Internet we have to teach students how to identify it and make a decision.

The problems and concerns raised about the integration of computing technology particularly the Internet into the curriculum caused some teachers to doubt whether or not it could really be a valuable part of the curriculum. One teacher made the following comment:

I'm not that familiar with the Internet, and what is going on it. From my understanding anyone can put information on it and how reliable the information is a problem, as opposed to texts which are approved. Right now, that might be a problem. What's good, what's bad.

Other constraints were more policy-related. Many, for example, were dismayed by the fact that no school or board policies existed for regulating use of the internet. Control of software to guard against copyright infringement was relatively easy when weighed against the daunting task of monitoring and controlling use of the internet. Once a student was on the internet, it was difficult to restrict where the student could and couldn't go. This unique aspect of internet use may potentially frighten teachers from using computers in their classrooms for any purpose. Judging by the experience of the following teacher, many teachers' fears were not unfounded:

[The] Big problem with this is I don't even know if we can control it. There seems to be a lot of talk about subjects that teachers have always been told you can't do that in the classroom. No one is setting out the curriculum on the Internet. Let's say a kid is suicidal. I was down there the other day looking for some material, and I don't know why it was in this section, I don't even remember the topic I was looking for. I didn't actually go to the menu but I could tell from the title that it was ways to commit suicide. It may have been Suicide Methods or something like that. Anyway, it was obvious right away to me. We had three suicides in this school a couple of years ago. Just think of the possibilities of kids looking at that.

Concern over use of the internet was also felt by members of the school administration. One of the vice-principals at the school cautioned that:

The control issue is the major problem. We know that kids are falling into some things on the Internet which are vulgar, which are racist, which are nothing short of pornography, and how we control that is a major problem. I think that there is another problem coming up and that is for some kids I have noticed that it has almost become addictive, so that if they become so addicted to searching and roaming through, then they will in fact lose. . . . I question how valuable some of the time is if they are just roaming through, instead of maybe doing what they are supposed to be doing, in terms of their other courses. Like, I've noticed a few students who have been in there every free moment that they have playing on it. So there is an addiction to it, isn't there?

DISCUSSION

This research used a case study design. Although there are many advantages of case study research for program evaluation and for use as a precursor to subsequent large-scale quantitative research (McMillan & Schumacher, 1997), case study has its limitations. The most important limitation seems to be related to the degree to which findings are generalizable to other contexts. It is certain that research findings from case studies are not generalizable in the framework outlined by Campbell and Stanley (1963). In order to overcome this limitation, some scholars such as Guba and Lincoln (1982) call for replacing the concept of generalizability with that of "fittingness." Specifically, they argue that the concept "fittingness", with its emphasis on analyzing the degree to which the situation studied matches other situations in which one is interested, provides a more realistic and workable way of thinking about the generalizability of research findings from qualitative research such as case studies. In this paper, we have clearly described the characteristics of the school involved in this study, so that readers can make their

own informed judgement regarding the generalizability of research findings from this study to other schools.

Given the above caution regarding generalizability, we would like to discuss a few implications of the research findings reported here. If what we found is any indication, then the burgeoning desire of students to exceed the current limits of their knowledge and experience is confined by what teachers and schools can and are willing to offer. For example, we found that though students demanded more computer access in their spare time, teachers were hesitant to assume responsibility for taking them to the labs. In addition, students who had computer access through course requirements set by their teachers developed a stronger desire to use additional computer attachments and peripherals (such as printers and sound facilities) than their peers. Also they wanted a greater variety of computer software, easier-to-use software, more information about software, and generally, more computer knowledge, which is beyond what teachers could offer.

Rockman (1993) stresses that money spent on educational technology must be matched with staff development, and that teacher training institutions must play a vital role in both preservice and in-service training. This seems to be the priority of most Canadian provinces (Council of Ministers of Education, 1996). However, according to the research findings of this study, for any type of teacher training, developing teachers' belief in the value of computers should be an important component. Although early research synthesis showed that computer-assisted instruction has a positive effect on learning (Niemic & Walberg, 1987), later synthesis studies show that the effect of computers on learning and on teaching remains preliminary, inconclusive, and differs by subjects and by types of computer applications (Ayersman, 1996; Berson, 1996; Fitzgerald & Koury, 1996; McCoy, 1996; Reed, 1996; Weller, 1996). More research into the effect of computer integration has to be conducted, and appropriate rationales have to be applied in the design of such research (Roblyer, 1996).

How to conduct in-services for teachers is another important issue. Some teachers we interviewed were not enthusiastic about that approach. When asked what things could be done to make teachers feel more comfortable with computer use, we received the following replies:

- I think we need to have more time to manipulate them on our time. I think that's more important sometimes than being in-serviced.

- I think probably one of the best ways is having somebody in the school, so he could go in with your class.
- We know that workshops do not significantly impact on the teaching unless there is consistent support and follow up. . . . We should be supporting them, we should be saying look, we have someone at the school who can go into your class and help you.

Although on-going technical support would be, theoretically, an ideal way of confronting the problem, in the present-day climate of cutbacks and budgetary restraints, this may well be impracticable for the majority of schools. In addition, because no computer resource person knows how to teach every school subject, the lion's share of planning and implementation would still rest on the teachers' shoulders. A suitable alternative might be to make a comprehensive computer-integrated curriculum available to teachers. Such a curriculum would provide teachers with detailed advice on how the teaching of each of their lessons could be assisted by technology. It would also act as an effective guideline, helping teachers avoid a trial-and-error or "last-minute" approach to preparing and organizing their lessons. The document could also include policies regarding the appropriate use of computers for both teachers and students. This would ultimately serve to boost the confidence of teachers struggling or hesitant to integrate computers into their curriculum. Of course, the implementation of a computer-integrated curriculum in each subject area would require the support of the school's administration. For example, the school time-table would have to be rescheduled in order to make it more flexible for teachers to efficiently mobilize their students.

In-service training, on-going technical support, and curriculum guidelines would no doubt help to reduce the constraint of teachers on students. Aside from these things, though, teachers will also need to have an open mind. Many students are undoubtedly going to know more about computers than their teachers do. Thus, teachers will need to place a certain measure of trust in their students, and be willing to learn from them. For example, even though teachers' knowledge of computers may be limited, they should be willing to give students opportunities to use computers to complete their course work.

It is clear that new policies and practices are required to achieve a more effective integration of computers into the school curriculum. As more and more investment dollars pour into this area, from both the govern-

ment and the private sector, greater attention needs to be paid to students and to how students' potential use of computers may be restricted by teachers. Although teachers are central to the integration of computers into the school curriculum, particularly in controlling student access to computers, in influencing computer course taking, and in affecting student attitudes toward the potential utility of computers, students' personal interest and self-motivation – particularly where multimedia/CD-ROM, tele-communications and, to an even greater extent, student attitudes toward computers are concerned – should not be overlooked. Teacher training on the subject of integrating computers into the school curriculum should focus on understanding students' demands and expectations, on the positive element of their personal interest and peer motivation, and on how teachers may create barriers to student learning in this area. Such a training program should also emphasize the ways in which teachers and students can work together towards achieving the full integration of computers into the school curriculum.

APPENDIX. Student Survey Questionnaire

Section I. Current use of computers.

1. Have you ever used computers? Yes ☐ No ☐

If Yes, please proceed.

If No, please go to Section III on page 5.

Section II. For those who have used computers.

2. What types of computer have you used?

Commodore ☐
 IBM PC compatibles ☐
 Apple ☐
 MacIntosh ☐
 Others (please specify) ☐

3. Where have you used computers?

School ☐ At home ☐ At friends' homes ☐ At stores, exhibitions, fairs etc. ☐

4. Have you ever taken a computer course? Yes ☐ No ☐

If you have, what grade was it in? _____

5. Have you ever used the new computer lab at the school? Yes ☐ No ☐

6. Have you ever used the old computer lab at the school? Yes ☐ No ☐

Integrating Computers into the Curriculum

7. Described below are some common types of computer software, check the frequency of the type you have used.

Type of use

Frequency of use

Computer - Assisted Organization

- | | |
|--|---|
| (1) Word processing/desktop publishing | every week ☐ most weeks ☐ some weeks ☐ |
| (2) Spreadsheet | every week ☐ most weeks ☐ some weeks ☐ |
| (3) Database | every week ☐ most weeks ☐ some weeks ☐ |
| (4) Others (please specify) | |
| _____ | every week ☐ most weeks ☐ some weeks ☐ |

Computer-Assisted Learning

- | | |
|-----------------------------|---|
| (1) Drill and practice | every week ☐ most weeks ☐ some weeks ☐ |
| (2) Tutorial | every week ☐ most weeks ☐ some weeks ☐ |
| (3) Simulation | every week ☐ most weeks ☐ some weeks ☐ |
| (4) Labs | every week ☐ most weeks ☐ some weeks ☐ |
| (5) Problem solving | every week ☐ most weeks ☐ some weeks ☐ |
| (6) Multi-media/CD-ROM | every week ☐ most weeks ☐ some weeks ☐ |
| (7) Recreational games | every week ☐ most weeks ☐ some weeks ☐ |
| (8) Educational games | every week ☐ most weeks ☐ some weeks ☐ |
| (9) Others (please specify) | |
| _____ | every week ☐ most weeks ☐ some weeks ☐ |

Internet

- | | |
|---|---|
| (1) Communication (such as e-mail) | every week ☐ most weeks ☐ some weeks ☐ |
| (2) Internet navigation (information searching, collecting and sharing) | every week ☐ most weeks ☐ some weeks ☐ |
| (3) Problem solving | every week ☐ most weeks ☐ some weeks ☐ |
| (4) Others (please specify) | |
| _____ | every week ☐ most weeks ☐ some weeks ☐ |

8. Described below are some possible reasons for which you have used computers.

Check the degree which best applies to you.

Reasons

Degree of applicability

- | | |
|------------------------------|---|
| (1) Interest/Exploration | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |
| (2) Required by the teachers | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |
| (3) Required by the parents | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |
| (4) Motivated by friends | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |
| (5) Others (please specify) | |
| _____ | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |

9. Described below are some difficulties you may have experienced.

Check the degree which best applies to you.

Difficulty

Degree of applicability

Hardware

- | | |
|---|---|
| (1) Can't get to a computer | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |
| (2) Don't have attachments (such as printer, sound) | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |
| (3) Computers and printers keep breaking down | Very applicable ☐ Somewhat applicable ☐ Not applicable ☐ |

(4) Computers too old and slow	Very applicable [] Somewhat applicable [] Not applicable []
(5) Other (please specify)	Very applicable [] Somewhat applicable [] Not applicable []

Software

(1) Not enough variety of software available	Very applicable [] Somewhat applicable [] Not applicable []
(2) Software too difficult to use	Very applicable [] Somewhat applicable [] Not applicable []
(3) Lack of information about the software	Very applicable [] Somewhat applicable [] Not applicable []
(4) Others (please specify)	Very applicable [] Somewhat applicable [] Not applicable []

Technical support

(1) Limited computer knowledge	Very applicable [] Somewhat applicable [] Not applicable []
(2) Not enough help	Very applicable [] Somewhat applicable [] Not applicable []
(3) Others (please specify)	Very applicable [] Somewhat applicable [] Not applicable []

School and family context

(1) Lack of teacher support	Very applicable [] Somewhat applicable [] Not applicable []
(2) Too busy with school work	Very applicable [] Somewhat applicable [] Not applicable []
(3) Others (please specify)	Very applicable [] Somewhat applicable [] Not applicable []

GO TO SECTION IV

Section III. For those who have never used computers

10. Described below are some possible reasons for which you have not used computers.
Check the degree which best applies to your situation.

Difficulty	Degree of applicability
(1) Can't get to a computer	Very applicable [] Somewhat applicable [] Not applicable []
(2) Can't get attachments (such as sound, printer)	Very applicable [] Somewhat applicable [] Not applicable []
(3) Computers and attachments keep breaking down	Very applicable [] Somewhat applicable [] Not applicable []
(4) Computers you can use are too old and slow	Very applicable [] Somewhat applicable [] Not applicable []
(5) Others (please specify)	Very applicable [] Somewhat applicable [] Not applicable []

Software

(1) No interesting software	Very applicable [] Somewhat applicable [] Not applicable []
(2) Software hard to use	Very applicable [] Somewhat applicable [] Not applicable []
(3) Not enough information about the software	Very applicable [] Somewhat applicable [] Not applicable []

Integrating Computers into the Curriculum

(4) Other (please specify) _____

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

Technical support

(1) Limited computer knowledge
and skills

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

(2) Cannot get technical assistance

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

(3) Others (please specify) _____

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

School and family context

(1) No teacher support

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

(2) Too busy with school work

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

(3) Too busy with other interests

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

(4) No support from family

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

(5) Others (please specify) _____

Very applicable ☐ Somewhat applicable ☐ Not applicable ☐

Section IV. Background

The following background information will help us to study equity issues in computer use in schools.
If you fell uncomfortable to answer any of the questions, you may leave it blank.

1. What grade level are you at?

Grade 9 ☐ Grade 10 ☐ Grade 11 ☐ Grade 12 ☐

2. Do you have a computer at home? If yes, for how many years have you had the computer at home?

☐ No ☐ Yes, for less than three years ☐ Yes, for more than 3 years

3. What are your grades

☐ Art Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

☐ English Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

☐ French Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

☐ Mathematics Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

☐ Science Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

☐ Social Studies Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

☐ Physical Education Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

☐ Others (please specify) _____

Above 85% ☐ Above 70% ☐ 50-70% ☐ Below 50% ☐

4. What is your gender? ☐ Male ☐ Female

5. Does your father work outside of the home? Yes ☐ No ☐

If yes, what is his job? _____

6. Does your mother work outside of the home? Yes ☐ No ☐

If yes, what is her job? _____

7. Do you have any handicap? Yes ☐ No ☐

If yes, what is it? _____

8. What is your ethnical background?

Oriental ☐ Black ☐ White ☐ Native ☐ South American ☐ East Indian ☐.

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ECONOMIC LIBERALIZATION AND WOMEN'S EDUCATION: PROSPECTS FOR POST-APARTHEID SOUTH AFRICA

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ABSTRACT. The post-apartheid South African economy is now responding, as elsewhere in Africa, to the fiscal/monetary exigencies of Structural Adjustment Programs (SAPs) as stipulated by the World Bank and the International Monetary Fund (IMF). A cardinal principle of SAPs is the reduction of expenditure on public education and other areas of social development. With that financial reality in place now, this paper examines women's education and related issues in the new South Africa. The basic proposition in this regard is that with SAPs now applying a downward pressure on educational expansion and affordability, women's education in general, and black women's in particular, will suffer in the long-run.

RÉSUMÉ. Comme celle d'autres pays d'Afrique, l'économie de l'Afrique du Sud se conforme depuis l'abolition de l'apartheid aux exigences fiscales et monétaires des programmes d'ajustement structurel (PAS) de la Banque mondiale et du Fonds monétaire international (FMI). L'un des principes fondamentaux sur lesquels reposent les PAS est la réduction des dépenses consacrées à l'enseignement public et à d'autres programmes de développement social. À la lumière de ces nouvelles réalités financières, l'auteur analyse la question de l'éducation des femmes et certains problèmes qui s'y rattachent dans la nouvelle Afrique du Sud. Il soutient à cet égard que les PAS réduisent l'accès à l'éducation et nuisent à son développement et qu'avec le temps, ce sont les femmes et surtout les femmes noires qui en souffriront.

The emancipation of women is not the task of women alone, but that of men and women alike.

The late Oliver Tambo, former Secretary-General of the African National Congress (cited in Sadie & Van Aardt, 1995:89).

Human development is development of all people. No society can progress half-liberated and half-chained. Human development, if not fully engendered, is fatally endangered.

Mahbub ul Haq, Principal author of the United Nations' *Human Development Report*, 1995.

Any discussion of women's education in South Africa presupposes, primarily because of the political and socio-economic objectives and results of these learning systems, a limited focus, at least, on the recent history as well as the current and potential future characteristics of the overall pedagogical situation. In that general temper and those contextual specificities, therefore, it will be observationally and analytically important to understand and explain both education's policy objectives and social outcomes under the prevailing socio-economic and political systems of one given epoch or another. In this essay, while the main focus is discussing and analyzing the potential impact of economic liberalization, i.e., Structural Adjustment Programs (SAPs), on women and women's education, I will also briefly, but relatively deeply, look at the history of education in preracial democracy South Africa.

The introduction of historical events as well as explaining current social systems under the policy and economic paradigms of South Africa's recent or distant past may not conform to the prevailing trends that could, at times, seem to be overwhelmingly focusing on the future. As important as that is in post-apartheid South Africa, though, it is still my understanding that *thinking in time*, i.e., using historical events and relationships to make prudent political and economic decisions, would still be a wise approach in relation to both the current situation as well as future essentialities and expectations.

The main proposition in this project is that with SAPs now being applied in almost all the countries of Sub-Saharan Africa, including South Africa (O'Meara, 1997), the long-term reduction on social expenditure will negatively impact on the overall educational attainment of South African women in general, and black South African women in particular. In the case of black women, this could still be so, despite the current Reconstruction and Development Program (hereafter RDP) (African National Congress, hereafter ANC, 1994) objectives of earmarking hundreds of millions of dollars over time to improve the educational situation of South Africa's disenfranchised blacks. And while the overall RDP objectives of direct redistribution by, for example, earmarking 2.5 billion rands for five years, as President Mandela has vowed, may be helpful in the long run, the needs will still, many times, outweigh the prescribed allocations (see Murray, 1993; Murphy, 1992).

Eventually then, and with SAPs applying a downward pressure on education, the prospects for post-apartheid effective and adequate systems of learning for women may not be that promising. That will be

complemented by the apparent economic reality where the South African government may not be able to go beyond the approximately 20 percent of the national budget it now spends on education (Bundy, 1950).

Before I specifically look at the general situation of women and women's education, though, I prefer to present succinctly some historical notes on South African education. The main objective of relaying this short historical presentation is to create a plausible analytical link between the contents as well as the character of colonial and apartheid education and the potential educational and development difficulties that are being experienced by women, especially those women who have been the most marginalized under these systems.

A BRIEF HISTORY OF EDUCATION IN SOUTH AFRICA

Keto (1990) asserts that precolonial traditional African societies in Southern Africa have evolved their indigenous systems of learning. These systems of learning, although informal, were, nevertheless, conducive to the processes of socialization and other social arrangements that were in place. Antithetical to Keto's argument is the position of Pells (1970) who claims that prior to the arrival of Europeans, Africans in South Africa were devoid of any systems of learning. It was, therefore, Pells (1970) continues, the burden of the European to educate the African, primarily for the efficient exploitation of the latter's human and natural resources.

It was not a coincidence, therefore, that with the arrival of the Dutch settlers in 1652 and beyond, education in South Africa became an instrument of subordination fulfilling Pells' twentieth century proposition with precise recording. Education in the post-settler era was designed and implemented for the cultural and psychological domination of the native population. Consequently, education served as a prerequisite for the myriad of schemes of marginalization that have befallen on the colonized groups. Kallaway (1984) describes this paramount colonial phenomenon:

The peoples. . . of South Africa were not simply conquered in a military sense; did not only lose their political independence; were not simply divorced from an independent [and self-sustaining] economic base; were not just drawn into new systems of social and economic life as urban dwellers and wage labourers, [but were also dominated with heavy doses of massive ideological transformation of

which the education system was one of the most important, if not the most important, major agent]. pp. 2-3

With the overall South African philosophy of education essentially responding to that situation, the socio-political system of the compulsory separation of races known as apartheid was legally implemented in 1948. With apartheid came the new segregationist concept of "own education" formulated in the Bantu Education Act of 1953 which was implemented in 1955 (Bundy, 1994). Both philosophically and technically, Bantu Education was an overwhelmingly racist policy that simply perpetuated the permanency of more powerful systems of cultural and economic deprivation negatively impacting on the lives of the perennially disenfranchised African population. The architect of Bantu Education, H.F. Verwoerd, former Minister of Native Affairs and later Prime Minister justified the situation this way:

What is the value of teaching the native child mathematics when he can not use it in practice [i.e. when he will not be trained for high paying professional jobs, see Macrae, 1994]? . . . If the native inside South Africa today in any of the schools in existence is being taught to expect that he will have his adult life under a policy of equal rights [vis-a-vis the European], he is making a big mistake. (cited in Suzman, 1993:36).

The separate systems of education for South Africans of different backgrounds were not conducive to the even development of all. Logically, that should not have been unexpected especially when one examines some essential quantitative and, therefore, qualitative components of education. In this specific case, these include per capita expenditure per pupil, teacher-pupil ratio for blacks and whites, and the outcomes of these in terms of matriculation and skills acquired for social and economic development.

In these basic aspects of education as of mid-1980s, for example, the per capita expenditure was 7:1 in favour of white children; the teacher-pupil ratio was 41:1 for blacks versus 19:1 for whites (Wilson & Ramphele, 1989). For African children, one stark result was the extremely disappointing situation of pupil progress where for every 100 black students entering grade one in 1969, only **four** have finished matriculation in 1978, while 69 percent of white children successfully did so (Wilson & Ramphele, 1989). In terms of the long-term consequences of these disparities, there are 4,467 tertiary education students for every 100,000 whites, and only 665 for an equal number of blacks (Herbst, 1994).

With black students coming into the post-apartheid education system so greatly handicapped, SAPs, by eventually reducing social expenditure, could actually thwart the educational attainment and, therefore, the developmental aspirations of these students. In terms of the situation of women who have lower levels of education and, therefore, higher illiteracy rates than their male counterparts (Sadie & Van Aardt, 1995), the overall impact will be hardly conducive to reducing the gap, let alone closing it. Beyond the illiteracy situation, the number of women in higher levels of secondary education and in tertiary education is again proportionally very low (Unterhalter, 1990). Before I go further into this central question, though, and for conceptual and policy clarifications, I would like to delineate some of the salient characteristics and objectives of SAPs. That relatively short observation will be followed by a discussion of the potential "problematics" of the interaction between post-apartheid education and women's development on the one hand, and between the latter and SAPs on the other.

STRUCTURAL ADJUSTMENT PROGRAMS: ESSENCE AND ARGUMENTS

Economic liberalization or neo-liberal economics is dominated by the view that supply creates its own demand. Stated otherwise, when the government does not intervene, the market will balance itself, tending toward equilibrium and full employment (Brooks, 1989). The terms themselves collectively describe the type of development reform policies propounded by the United States government and affiliated prominent International Financial Institutions (IFIs). These policies, commonly known as Structural Adjustment Programs (SAPs), should contain, as they are presented by the Bretton Woods institutions of the World Bank and the International Monetary Fund (IMF): fiscal discipline, overhauled public expenditure, tax reform, financial liberalization, exchange rates responding to IMF priorities, systemic privatization of major government institutions, direct foreign investment, deregulation, and property rights (Williamson, 1993).

To the adherents of the neo-liberal paradigm, SAPs and everything that comes with them are not just representing the economic ideology of certain institutions or countries, they simply make good sense in development issues. SAPs, therefore, should be adopted universally (Williamson, 1993). Evidence from Africa, though, shows that the application of SAPs has not been successful. If anything, SAPs seem to have proven that they are not capable of remedying Africa's economic or other institutional (e.g., "democracy") woes (Bienefeld, 1995;

Cheru, 1995; Ihonvbere, 1995; Sinha, 1995; Saunders, 1995; Plank, 1993; Bowen, 1992; Schmitz & Hutchful, 1992).

In discussing what he terms as “the reckless behaviour” of IFIs, Bienefeld (1995) points out how even experience does not override the “sacred” neo-liberal ideology of SAPs:

The disastrous impact of neo-liberal policies in Eastern Europe is a graphic reminder of the centrifugal forces unleashed by their reckless adoption (or imposition) under inappropriate conditions. And Africa bears the scars of the same errors of judgment because the IFIs used the leverage conferred on them by the debt crisis to spread these high risk policies in the impoverished continent. (p. 52)

Schmitz and Hutchful (1992) also see economic liberalization as essentially reducing Africa’s chances of a better tomorrow. They see globalization as “posing a greater danger of a systemic breakdown in the socio-economic fabric of Africa. . . . This will be mainly due to the loss of sovereignty over economic policies by African states to IFIs” (p. 13). With the verdict on SAPs economic and government policies in the general African scene this harsh, what could be their impact on women and women’s education in South Africa? Before we deal with this question, though, let us first look at the World Bank’s policy on education.

Perhaps the least productive aspect of the World Bank’s educational policy is its unwavering adherence to the prominence of human capital theory in education and development (Jones, 1992). The underlying premise of this theory is that human skill and knowledge, when fully maximized, will lead to the transformation of societies. And as Jones (1992) again points out, that may be the case in economies that are expanding but not necessarily in shrinking or even slowing economies. The South African economy is indeed a good example, for it has been expanding in the 1950s and 1960s, slowing in the 1970s, declining in the 1980s, and not recovering that much in the 1990s (Bundy, 1994; Murray, 1993).

In the World Bank’s 1994 Annual Report, the emphasis is, for example, on post-secondary training rather than tertiary education. That apparently does not take into account that education is not only definable in sets and subsets of economic calculations, but as Jones (1992) notes, education also implicates, emphasizes, and allocates social values, roles, and responsibilities. Moreover, the Bank is seemingly producing a “cluster” of statements on education that are more than once contradic-

tory. These policy points relate to such issues as promoting privatization, diversification of funding sources, linking funding to performance, while at the same time proposing an increase in equity and accessibility in higher learning. Whatever the Bank's real aims in this regard are, a closer examination of the situation may reveal that the Bank's education policies, especially in higher education, will produce the adverse effects of accessibility and equity in developing countries such as South Africa.

WOMEN IN POST-APARTHEID SOUTH AFRICA: A GENERAL OVERVIEW

To create a developmentally accountable and more equitable socioeconomic terrain for all South Africans while at the same time fulfilling its economic liberalization obligations, the government, in its 1995/96 budget, attempted to achieve two important aims: keeping, at least to some extent, its RDP promise, while at the same time "keeping the business community happy." In echoing the latter objective, the South African Chamber of Business praised former Finance Minister Chris Liebenberg, himself a former banker, "for designing a budget that balances the needs of the RDP and the imperative of ongoing fiscal restructuring" (*Africa Recovery*, June, 1995:23). In this budget at least, therefore, the RDP which is not a likely bedfellow of SAPs, has somewhat benefited. An 11 percent defense cut was used to increase spending on health, education and housing, with education getting the highest sum of 21 percent of total spending (*Africa Recovery*, June, 1995).

While women who constitute 54 percent of the South African population, but form 39.4 percent of the country's workforce (Sadie & Van Aardt, 1995) could directly or indirectly benefit from the limited increase in social spending, the remedies as they are prescribed now could only scratch the surface of a cluster of underdevelopment ailments that affect the lives of South African women. The essence of underdevelopment in this case is not limited to educational and economic issues. There are also other basic issues that directly impact upon the lives of women, and that have been relatively neglected. A telling point in this regard, for example, is that it was only in 1993 that the South African government, while primarily responding to international pressures, signed a number of United Nations (UN) conventions on Women. Among these were the *Convention of Political Rights for Women* and the *Convention for the Elimination of All Discrimination against Women*. In addition, the government has created three draft bills: the Promotion of Equal Opportunities; the Prevention of Domestic Violence; and the Abolition of Discrimination against Women (Sadie & Van Aardt, 1995).

At the grassroots level, Women's National Coalition (WNC) was formed in 1992 from seventy organizations of all religions and races. And as Sadie and Van Aardt (1995) point out, WNC's importance for South African women is conveyed in:

1. Women collectively aspiring for, and demanding their rights.
2. The coalition representing an enduring symbol for women who are now represented by an organization whose primary objectives are empowering all South African women.

The existence and temporal evolution of such an organization is also warranted by an overall disadvantaged socio-economic situation of women vis-a-vis men. As indicated earlier, women as a group in South Africa are less educated than men; they are also less likely to be employed, and even when employed, they are overrepresented in what is termed as "pink-collar" jobs, i.e., nurses, therapists, social workers, hairdressers, and teachers (Sadie & Van Aardt, 1995).

Moreover, and while there are more women in South Africa than men, women, for example, hold only 1.3 percent of corporate positions in the Johannesburg Stock Exchange's 657 companies (Sadie & Van Aardt, 1995). Apparently, the situation of women in post-apartheid South Africa requires special affirmative programs that should redress not only apartheid's segregation policies, but also gender-based inequities that could hinder the potential of a majority of the country's population. And education is, beyond doubt, the primary candidate for improving the condition of women now and into the future.

BLACK WOMEN AND SAPS

Although they form the majority of South African women, black women have also another less enviable distinction. They are the most marginalized group in all of South Africa (Sadie & Van Aardt, 1995). This is directly related to the legacy of apartheid where with their male counterparts, black women were relegated to the scrap-heap of economic development and socio-political emancipation. And because of that, there are marked differences between white women and black women, with the former, while numerically about one-fourth of the latter, still constitutes 20.4 percent of all economically active women. Moreover, among all women, white women are overrepresented in managerial, executive, and administrative occupations (almost 78 percent of all women in these categories), while 83 percent of women in service occupations are African (Sadie & Van Aardt, 1995). As low

wage earners, the next highest concentration of black women workers is in the agriculture sector (Barrett et al., 1985).

Women, therefore, were not, and are not a homogeneous group in South Africa. Their lives and futures are coloured by conspicuously marked trends of primarily race-induced class distinctions. As such, South Africa was both a wealthy First World country and a poor Third World "nation" (Robertson & Robertson, 1977). It is practically, because of this reality, that black women have more in common, at least in development terms, with other African women than with their white compatriots in South Africa. In that sense, African women in South Africa are victims of what is termed as "double deprivation" (*Africa Recovery*, December, 1995). That is to say that while overall human development was low for black South Africans, black women's situation was worse than black men's. This is apparently an African version of what, in other contexts, Carty (1993) and Mohanty (1992) call *multi-layered marginalization*.

Even with the graduated effects of SAPs on education in RDP-South Africa, black women, as women elsewhere in Africa, may still have more problems to deal with than any other group in the country. The double burden that SAPs place on poor African women is that while these women have little to cushion them against its overall impact, they still have to take on more work. This is so because African women, who are primarily responsible for making family ends meet (*Africa Recovery*, December, 1995), have to compensate for any income shortfalls in their household.

BLACK WOMEN'S EDUCATION AND SAPS

With black women finding themselves at the bottom of a steep hierarchy of race, class, and gender differences in the new South Africa, it is clear that their most potent weapon to challenge the slippery slopes of development is quality education which is affordable. The hurdles these women may have to jump over, though, or sometimes fall over, are numerous and cumbersome. This will be so even with the unhindered application of the education component of the RDP.

This assertion is supported by the fact that even within the less than encouraging situation of women's education in South Africa, black women are many "knots" behind others. In one occupation (artisans, apprentices, and related occupations), for example, where women's overall share is 5.1 percent, African women's share is a dismal 0.2

percent (Sadie & Van Aardt, 1995). This reality, while representing one aspect of women's venture into hitherto uncharted occupational territory, could also serve as a distinguishing marker for the task that is awaiting South Africa in implementing tangible programs for black women's education and development.

That task will again be complicated by another fact that is also common in almost all the countries of Sub-Saharan Africa. While women have to engage in wage earning activities to supplement the family's income in a high unemployment global economy, they also have to do unpaid domestic and other family work that is estimated at \$11 trillion (*Africa Recovery*, December, 1995). This massive amount of money goes unrecorded in the global economy. What it conspicuously does, though, is that it reduces women's physical capacity to develop their potential. It also reduces their leisure time and unpressured decision-making moments for personal evaluation and choice implementation. Moreover, the burden of this unpaid work almost nullifies women's chances of balancing their individual and group aspirations in how much and what resources they spend on what tasks as well as analyzing any tangible returns from a given activity.

As the combination of job demands – mostly triggered by fiscal restructuring and incessant house work – reduce the possibility of women acquiring the education they need to “jump-start” their development, the implications will not be limited to women alone. The perception that the mother's education as well as the values she places on schooling being important environmental factors in influencing scholars' success or failure are to be considered. It was Jawaharlal Nehru, India's post-independence Prime Minister who said that “it is more important, if there can be any comparison, for the women of a nation to be educated than its men” (cited in Ghosh, 1986:25).

For black South African women, the educational situation at all levels seems to demand nothing short of an emergency that goes way beyond the overall allocations of the RDP. With the majority of these women in rural or semi-rural areas, they are the least educated and, therefore, “helplessly dependent” on men for their livelihood. To improve their situation and that of their families then, these rural women could, for example, receive and make use of capacity-building projects and other specialized training initiatives that could increase their ability to become self-supporting. These types of programs differ from other “aid” projects in that they have the potential of economic sustainability for many years and even for decades. Stated otherwise, projects of this

nature do not solve the problem for a day or a season; they, instead, equip people with the basic skills to effect positive, permanent changes in their lives.

A project of this nature that I am personally familiar with and intellectually contributed to its formation was implemented in civil war-torn Somalia in 1994 by the African Society for Humanitarian Aid and Development. It is an African Non-Governmental Organization (NGO), supported with help from the Canadian International Development Agency (CIDA), and Partnership Africa-Canada (PAC). The particular program created four capacity-building centres where women are receiving literacy programs, basic health education including pregnancy and maternity information, sewing lessons and sewing machines, and basic typing and administrative skills. This program is now many times more productive and more enduring than many other, more expensive projects. And suffice it to say that many women who participated in this project are now capable of transferring their skills to others who, in turn, could do the same for many years to come. All of this does not mean, of course, that the majority of black South African should be in the same socio-economic "circle" with displaced women in stateless Somalia, but starting from somewhere, acquiring the necessary skills and confidence, and progressing slowly but steadily could be pragmatically useful and culturally desirable.

In the case of higher education achievement, and while the overall number of women holding post-matric degrees is very low, the case is again discouragingly dismal for black women. In this case, of all post-matric degrees or certificates held by South Africans, white women have 14 percent, Indian women have four percent, coloured women have two percent, and African women have one percent (Sadie & Van Aardt, 1995).

CONCLUSION

Finally, in assessing the situation of all South African women in general, and black women in particular, we conclude that the overall impact of SAPs could hardly be conducive to elevating women's education. What these could produce, at least in the long-run, is to increase the gap of education between those who can "hop" on the bandwagon of the global economy and those who are desperately trying to cling to it.

As the speed of the neo-liberal economy train increases, though, the educational impact will be more negative for South African women

than men, and among women, it will be black women who find themselves more marginalized by SAPs than any other group in the country. And at the end of the day, the case may not resemble anything that borders on the empowering situation women so vigorously should demand. Hence, there is the real possibility of South African women again lacking the long-awaited economic and social empowerment that would have enabled them "to have a real choice in what they want to do, and in establishing a society that affirms and values that choice" (Sadie & Van Aardt, 1995 p. 89).

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READING RECOVERY: RESPONSE FROM THE FIELD

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ABSTRACT. As an intervention for children who are experiencing difficulty with the development of their entry level reading skills, Marie Clay's (1985) *Reading Recovery* has become a popular alternative for many professional educators. As the use of Clay's program has spread across North America, the benefits that were originally suggested by Clay and others have received considerable support. Close scrutiny of the program, however, has also revealed problems with implementation, maintenance, and evaluation strategies. Smaller schools and school divisions that are trying to implement *Reading Recovery* are discovering that these problems are especially imposing and difficult to manage and that this seems to be particularly the case in rural and remote areas of the country. This paper attempts to identify and discuss the extent and impact of some of those problems from the perspective of field-based educators in Manitoba.

RÉSUMÉ. Méthode d'intervention auprès des enfants qui éprouvent des difficultés à acquérir des connaissances de base en lecture, *Reading Recovery* de Marie Clay (1985) propose une solution de rechange qu'ont adoptée de nombreux éducateurs professionnels. Ce programme est maintenant très en vogue en Amérique du Nord et les avantages que prédisaient Clay et d'autres intervenants ont été confirmés par de nombreuses sources. En y regardant de plus près, on se rend toutefois compte que le programme présente des problèmes sur le plan de la mise en oeuvre, de l'entretien et des stratégies d'évaluation. Les écoles et commissions scolaires de plus petite taille qui tentent de l'implanter constatent que ces problèmes sont très graves et difficiles à surmonter, particulièrement en milieu rural et dans les régions éloignées. Cet article vise à cerner et à analyser la portée et les répercussions de certains de ces problèmes vus dans l'optique des éducateurs travaillant sur le terrain au Manitoba.

In the province of Manitoba, resource teachers, reading clinicians, and student service administrators (formerly known as special education co-ordinators) play a large part in the selection, implementation, and evaluation of interventions that have been developed for use with

students at risk for school failure. Without this mechanism, school divisions would be hard-pressed to separate those interventions that show promise from those of more limited utility. One intervention that continues to draw the attention of those educators referred to above is Marie Clay's (1985) *Reading Recovery*.

THE "READING RECOVERY" PROGRAM

Reading Recovery was introduced in New Zealand during the early 1970s (Clay, 1985) and was subsequently carried to North America in the early 1980s (Hiebert, 1994; Wasik & Slavin, 1993). Since that time it has been accepted by many American and Canadian educators as one of the more effective interventions for teaching entry level reading skills to Grade 1 children considered to be at risk for reading failure (Center, Wheldall, Freeman, Outhred, & McNaught, 1995; Pinnell, Lyons, DeFord, Bryk, & Seltzer, 1994; Rasinski, 1995a; Shanahan, & Barr, 1995; Spiegel, 1995; Wasik & Slavin, 1993). At the present time it is in use at thousands of sites across North America where it appears it is being applied with considerable fidelity to the model that was originally proposed by Clay in 1972 (Pinnell, Lyons, & Jones, 1996).

Selection of students

In New Zealand, children are selected for inclusion in *Reading Recovery* if, after one full year of formal instruction, they show signs of experiencing difficulty with beginning reading skills. Because formal reading instruction in New Zealand begins in kindergarten, this means that *Reading Recovery* is initiated in Grade 1 (Clay, 1985; Shanahan & Barr, 1995). In the USA, the practice of implementing the intervention in Grade 1 has been retained, even though many children receive no formal reading instruction prior to Grade 1 (Shanahan & Barr, 1995). In both countries, the identification of candidates is carried out through the use of tests (i.e., both criterion-referenced and norm-referenced) and teacher observation. However, diagnostic strategies tend to focus on those assessment instruments that were developed by Clay as part of the *Reading Recovery* "package" (Clay, 1985; Spiegel, 1995).

Components of the intervention

Reading Recovery was developed following a tutorial model. Each candidate participates with a fully trained *Reading Recovery* teacher in a series of individualized, thirty-minute sessions. The strategies that are employed during these tutoring sessions have been clearly defined by

Clay and are organized into four clusters. (For a more detailed description of the intervention, please see Clay, 1985; Pinnell et al., 1994; and Wasik & Slavin, 1993.)

In any given session, the child begins by reading two or more stories or books that have been read successfully in previous sessions. The child then goes on to read the book that was introduced during the preceding session. As the child reads, the tutor assesses fluency, use of appropriate strategies, and other skills by means of the running record, a form of miscue analysis. In the third part of the session, the child writes a sentence or short story, usually independently but sometimes from dictation. This message is recorded and cut into pieces by the tutor for subsequent re-assembly by the child. Finally a new book is introduced and read. Study of specific letters and words can be introduced at any time during the session, and it is common for sentences and books to be taken home for additional practice.

EVALUATION OF PERFORMANCE

Regardless of the intervention being employed, individual children respond differently. In the case of *Reading Recovery*, participants tend to fall into one of three categories based on their response to the intervention.

EXCUSED CHILDREN. Approximately 5 to 7% of any given cohort of candidates experience immediate and serious difficulty with the program. When this happens during the preliminary phase that Clay (1985) calls "Roaming around the Known" or during the initial stages of actual tutoring, the program is judged to be an ineffective and, therefore, inappropriate alternative, and the child is excused from participating (Center et al., 1995; Hiebert, 1994). For these children, alternative forms of intervention must then be found.

NOT-DISCONTINUED CHILDREN. A second group of children respond positively to the intervention and show progress in the development of their literacy skills, but they fail to meet the expected goal of average functioning in the area of literacy development, even after completing an extended tutorial. As a result, they cannot be successfully discontinued from the program. Estimates of the proportion of the cohort of candidates that falls into this not-discontinued category range from 9% (Hiebert, 1994) through 11.6% (Shanahan & Barr, 1995) to 27% (Center et al., 1995).

DISCONTINUED CHILDREN. Of the children originally targeted for intervention, 60 to 75% demonstrate significantly, and in some cases dramatically, improved performance (Center et al., 1995; Hiebert, 1994; Rasinski, 1995a; Shanahan & Barr, 1995). Improvements in functioning become particularly apparent during and immediately following the intervention (Shanahan & Barr, 1995; Wasik & Slavin, 1993), but there is some evidence that improved functioning continues into subsequent grades (Pinnell et al., 1995; Shanahan & Barr, 1995; Wasik & Slavin, 1993). Because this group of children meets or exceeds the criterion of average functioning in the area of literacy skill development, the intervention can be withdrawn and the children can be classified as successfully discontinued.

Strengths of the intervention

The strategies that are employed to generate fluency in reading, writing, and spelling were built into the program by Clay (1985) with considerable care and deliberation. It is now being acknowledged that Clay's attention to the selection and presentation of these strategies has been fundamental to the successful application of the model (Hiebert, 1994; Pikulski, 1994; Spiegel, 1995). The features of *Reading Recovery* that have been identified as particular strengths include: a) intervention that is early enough to prevent initial weaknesses from turning into ingrained deficits; b) the use of experienced and well-trained teachers as tutors; c) the setting of appropriate, well-planned goals, as well as the frequent reviewing of those goals based on on-going assessment; d) the use of direct, individualized instruction, based on skillful analysis of student performance and delivered at the child's instructional level; e) the use of teaching materials that feature natural language (i.e., language that "retains the full power of semantic and syntactic richness" (Clay, 1985, p. 13) rather than strictly controlled vocabulary; f) the paying of careful attention to phonemic awareness during reading, writing, and spelling activities; g) the use of repeated reading of familiar texts to develop reading fluency; and h) the teaching of reading, writing, and spelling skills through the use of extensive writing practice.

CONCERNS FROM THE FIELD

Clay's *Reading Recovery* (1985) is a comprehensive, well-organized intervention which seems to be highly effective with certain groups of children who are experiencing difficulty with entry level reading skills (Center, Wheldall, Freeman, Outhred, & McNaught, 1995; Pinnell,

Lyons, DeFord, Bryk, & Seltzer, 1994; Rasinski, 1995a; Shanahan & Barr, 1995; Spiegel, 1995; Wasik & Slavin, 1993). Moreover, the rapidity with which the program has spread to thousands of sites across North America (Pinnell, Lyons, & Jones, 1996) would seem to suggest that the positive conclusions that are being proposed by researchers in the area of emergent literacy are being reflected in the attitudes and practices of many educators in the field. This does not mean, however, that *Reading Recovery* stands as a panacea, ready for instant application where children exhibit reading difficulty. Enthusiasm for the approach has been tempered by a certain level of concern which continues to be a focus for discussion among educators in Manitoba and elsewhere.

Criteria for inclusion

The identification of students requiring tutorial by means of norm-referenced or criterion-referenced tests, and the systematic observation of reading and writing behaviours conforms to what could be termed traditional practice. However, it may be that other factors are contributing to the inappropriate targeting of certain children for intervention.

Hiebert (1994) observed that some of the *Metropolitan Achievement Test* scores from one cohort of children who had been directed into the *Reading Recovery* program fell into the fourth quintile. A score in the fourth quintile is certainly low, but it is not necessarily an indicator of a need for special intervention. This use of elevated cut-off points, taken together with the observation of Center et al. (1995) that in one major study 29% of the control group achieved average reading levels without special intervention, would tend to support a conclusion that has been reached by Shanahan and Barr (1995), namely that it is possible that *Reading Recovery* is in fact being offered to large numbers of children who are not in need of intensive remediation. Resource teachers, reading clinicians, and student service administrators recognize the need for precision when targeting individuals for special attention such as one-to-one tutoring. Even the possibility that children are receiving this level of service in the absence of any real need is, of course, a matter of concern.

Another aspect of the problem with the precise targeting of individuals for service appears when the "not-discontinued" subgroup is examined. Up to 27% (Center et al., 1995) of the children in identified cohorts fail to achieve average levels of functioning in reading and writing, and cannot, therefore, be successfully discontinued from the program. Fur-

thermore, in subsequent grades, these students tend to continue to perform at levels that are markedly lower than those of their classmates (Wasik & Slavin, 1993). It seems, therefore, to be obvious that *Reading Recovery* may not be the intervention of choice for all students. The task of the professional in the field then becomes not only to employ *Reading Recovery* for those cases where diagnostic strategies suggest that it is an appropriate vehicle for remediation but also to find the alternatives that will allow the children who would have fallen into the "excused" category or into the "not-discontinued" category to experience success and to achieve at level.

Achievement of discontinued children

Two of the main goals of the *Reading Recovery* program are: a) to allow children to achieve an average level of functioning in the area of literacy skill development, and b) to allow them to develop a "self-extending system for reading to enable them to carry on functioning at an average level in subsequent grades" (Pinnell, DeFord, Lyons, & Bryk, 1995; Pinnell, Lyons, & Jones, 1996). It is toward the realization of these goals that most Early Years educators are currently working, and, in Manitoba, many resource teachers, reading clinicians, and student service administrators are now attempting to determine the extent to which *Reading Recovery* is able to contribute to these ends.

The point has been made that most first grade children (i.e., 60 to 75%) who are targeted for intervention through *Reading Recovery* do in fact achieve average levels of functioning and can be successfully discontinued from the program. Furthermore, changes in levels of functioning are not only statistically and practically significant but often dramatic (Center et al., 1995; Rasinski, 1995a, 1995b; Shanahan & Barr, 1995; Wasik, & Slavin, 1993). Thus it would seem that there is now evidence that the first of the identified goals can in fact be met, and, in this respect, critics have generally been willing to give *Reading Recovery* its due.

Some of the critics have also been quick to point out that there are factors present which complicate attempts to interpret the available data. For example, the children who successfully complete the *Reading Recovery* program tend to do particularly well when assessments make use of instruments and strategies that are "articulated with" or very similar to the training strategies that make up the program (Rasinski, 1995a; Wasik & Slavin, 1993). This is to be expected because, in cases such as this, performance during evaluation requires, as Campione and Brown (1987) have observed, little more than maintenance or near-

transfer of acquired skills. However, when assessments are based on standardized tests of achievement, evidence of improved levels of functioning is either absent or, at best, only slightly apparent (Hiebert, 1994; Shanahan & Barr, 1995). This is somewhat alarming because it suggests that the training regimen (i.e., extending to a maximum of sixty sessions) is not able to bring about the far-transfer or even the intermediate-transfer of acquired skills to dissimilar but related evaluation tasks. In other words, Center et al. (1995) would seem to be making an important and valid observation when they suggest that the available data do not seem to support the generalization of skills acquired during tutoring.

Regarding the development and application of self-extending strategies during performance of literary tasks in later grades, additional and more serious problems emerge from the available research. Whether the second goal cited above is conceptualized in terms of Pinnell et al.'s (1994) "self-extending system for reading" or Campione and Brown's (1987) intermediate- or far-transfer of acquired skills, it is clear from the accumulated data that problems with literacy skill development and application frequently continue following "successful" discontinuation from the *Reading Recovery* program. For example, while successfully discontinued children have, by definition, achieved average levels of functioning in their acquisition and application of entry-level literacy skills, their rate of progress in literacy skill development through Grade 2 tends to be considerably slower than that of their classmates who from the beginning were identified as functioning in the average range (Shanahan & Barr, 1995). In addition, the magnitude of treatment effects observed during training and immediately following discontinuation show steady decline through Grades 2 and 3, even where progress is being assessed by means of instruments that are "articulated with the program of instruction" (Center et al., 1995; Hiebert, 1994; Shanahan & Barr, 1995; Wasik & Slavin, 1993). Finally, by Grade 3 or 4, levels of skill maintenance among *Reading Recovery* tutees who were successfully discontinued by the end of Grade 1 tend to be very low (Hiebert, 1994; Shanahan & Barr, 1995), and rates of retention closely resemble those of students who served as matched controls (Hiebert, 1994; Wasik & Slavin, 1993).

SUMMARY. It is, therefore, neither wise nor even possible to assume that *Reading Recovery* will serve the needs of all Grade 1 children who show signs of being at-risk for reading failure. "Excused" children and "not-discontinued" children in particular need access to alternatives that

will allow them to capitalize on their literary abilities and interests. It is also not possible to assume that *Reading Recovery* will allow teachers to repair skill deficiencies and to promote, automatically, the generation of new skills in the future. Children at risk may have their entry-level reading skills raised to an average level in Grade 1, but as the demands of language arts programs increase through Grades 2 and 3, it is not unreasonable to expect to see the appearance of additional and possibly more complex problems. In short, all of those children who, through the course of their involvement with *Reading Recovery*, are identified as "excused" or as "not-discontinued" and many of those who are identified as "successfully discontinued" will probably require additional consideration, including the extension of their intervention, in one form or another, into Grades 2 or 3 (Pikulski, 1994; Shanahan & Barr, 1995; Wasik & Slavin, 1993).

Reading recovery teachers

While most attempts to evaluate *Reading Recovery* have focused on ways in which students benefit from the intervention, it has become clear that being trained as a *Reading Recovery* tutor carries benefits for teachers as well, benefits which have been identified and described by Shanahan and Barr (1995). *Reading Recovery* gives teacher trainees access to a repertoire of highly effective strategies for diagnosing and remediating early reading difficulty. In addition, trainees are provided with the opportunity to apply those strategies under closely supervised and highly supportive conditions. Proficiency at dealing with young children who are at risk for reading failure leads, in turn, to a greater sense of empowerment, increased levels of respect from colleagues, and improved self-esteem.

As greater numbers of *Reading Recovery* teachers become available to schools and school systems, it seems reasonable to expect that benefits would extend beyond the level of the individual participant to the larger educational context. Yet a couple of factors appear to be preventing this from happening. In the first place, *Reading Recovery* was developed as a supplementary intervention which was never really intended to be integrated into programs that run in conventional classrooms (Center et al., 1995; Pikulski, 1994; Wasik & Slavin, 1993). The net effect of this difference in philosophy has meant that *Reading Recovery* has continued to operate more or less independently of the organizational structure of the schools in which it has been housed (Center et al., 1995). The second factor has to do with the *Reading Recovery*

teachers themselves. At present there is evidence to indicate that, specifically where their expertise in diagnosing and treating reading difficulty is concerned, *Reading Recovery* teachers tend not to communicate effectively with their colleagues in the classroom nor with their administrators (Center et al., 1995; Shanahan & Barr, 1995). In fact, when *Reading Recovery* is moved into a school, there is little or no evidence to suggest that regular classroom teachers benefit professionally, or that there is any improvement in the quality of instruction in their classrooms (Hiebert, 1996; Pikulski, 1994; Shanahan & Barr, 1995).

Cost of implementation and maintenance

A number of factors contribute to the cost of implementing *Reading Recovery* in a school division. Generally these include: tuition and training materials for each trainee as well as the purchase of instructional materials for each school. Of course, to maintain the program, each division or district is then required to provide salary and benefits for each *Reading Recovery* teacher. The amount of money that is required over the course of this process is substantial, and has led several researchers to conclude that *Reading Recovery* is without question one of the most expensive remedial interventions available to educators today (Hiebert, 1994; Nikiforuk, 1995; Rasinski, 1995a, 1995b; Shanahan & Barr, 1995; Wasik & Slavin, 1993).

With a change of setting, from larger to smaller population centers, such as those found in rural and remote areas of the country, additional factors carry the expense of delivering *Reading Recovery* even higher. In Manitoba, *Reading Recovery* teacher trainers are available only in the two major population centers, the cities of Brandon and Winnipeg. Therefore, for each teacher chosen to be trained as a *Reading Recovery* tutor, school divisions which are located at a distance from the larger urban centers are put in the position of having to absorb the cost of travel to and from the training center as well as the cost of accommodation and meals while at the center. Furthermore, as distances from the training center increase, these additional costs escalate. When all of the costs cited above are totalled and multiplied by the number of candidates for whom training is being sought, the financial difficulties facing small rural and remote school divisions become obvious. (One *Reading Recovery* teacher per school appears to be the accepted minimum.) Even where school divisions are operating from tax bases that are not particularly restricted, the overall cost of implementing and

maintaining *Reading Recovery* becomes prohibitive, and less expensive alternatives have to be found.

NUMBER OF STUDENTS AS A FACTOR. A large expenditure for the implementation and maintenance of a program can be justified if a large number of students is being served. In the case of *Reading Recovery*, it has been suggested that each full-time tutor should be able to serve sixteen students per year (Dyer, cited in Hiebert, 1994). In fact, it seems that the actual number falls to between 9.8 (Shanahan & Barr, 1995) and 11 (Hiebert, 1994), with the number of discontinued students reaching only 9 (Hiebert, 1994). It is for this reason that *Reading Recovery* continues to be regarded as an overly expensive option among remedial interventions.

For smaller school divisions, a somewhat different but related factor again serves to drive the cost of *Reading Recovery* even higher. Frequently, in smaller schools, the number of candidates deemed suitable for *Reading Recovery* falls far short of 16 or even 9.8, making the use of a full-time tutor an impractical option. Where individual schools are able to identify only a few candidates, it might be possible to employ Clay's tutorial model through the use of part-time or itinerant tutors. It would then, however, be reasonable to expect delivery costs to rise correspondingly, as, for example, travel costs were factored into the equation.

IMPLICATIONS FOR EDUCATORS IN THE FIELD

Over the years, attempts to evaluate *Reading Recovery* (Clay, 1985) have frequently been marred by the presence of serious methodological flaws (Hiebert, 1994, 1996; Shanahan & Barr, 1995; Wasik & Slavin, 1993). Specific problems that have been identified in the literature include: the exclusion from statistical analyses of data from "excused" and/or "not-discontinued" children; the lack of equivalence of experimental and control/comparison groups, with, for example, retained students being over-represented in comparison groups; and the persistent tendency to overlook regression to the mean as an important factor in the analysis of post-test data. The overall effect of these and related problems has been the generation of flawed data bases, resulting in evaluations that fall below standard where appropriateness and effectiveness are concerned.

Practitioners in the field should, of course, be concerned by problems such as those which are cited above. However, their greatest concern should be reserved for problems that pertain to the actual application of the model. The widespread popularity of *Reading Recovery* in North America testifies to the esteem in which Marie Clay and her intervention are held. Yet concerned educators, including resource teachers and student service administrators, cannot afford to look away from those problems that are particularly associated with a) matching intervention strategies to student needs, b) creating stable repertoires of skills which generalize, c) integrating *Reading Recovery* into an overall remedial program, and d) making the program affordable.

Accommodating diverse student needs

"EXCUSED" CHILDREN. Pinnell, Lyons, and Jones (1996) have stated that *Reading Recovery* was designed to serve "hardest to teach" and "lowest achieving" children. Yet children who reveal themselves to be unresponsive to the component strategies are routinely excluded from the intervention. This practice may be justifiable in a program of research which is examining the efficacy of a particular intervention, but the exclusion of unresponsive children is simply not an option for resource teachers, reading clinicians, and student service administrators, who, for the most part, hold themselves accountable for student failure. If it is not possible to modify the component strategies that make up *Reading Recovery* to suit the specific needs of low achievers, then it is the duty of educators in the field to find more suitable alternatives.

"NOT-DISCONTINUED" CHILDREN. For a child to linger in a remedial program for up to 60 sessions and still not reach the minimum criterion for successful discontinuation is also unacceptable to practitioners. Where children have needs that require intervention, those needs must be identified as early as possible, either through refinements to the strategies that are employed for identification or through more stringent monitoring of daily progress. Where it becomes evident that identified needs exceed the remedial capabilities of *Reading Recovery*, resource teachers will then have to supplement the program or even provide the child with a more appropriate alternative.

"DISCONTINUED" CHILDREN. The possibility that some children who are being directed into *Reading Recovery* might be served just as effectively in the regular classroom or through less intrusive remedial programs is also troubling to educators in the field. One-to-one interventions are too

costly to squander and must be reserved for those children who are seriously at-risk for reading failure. Refinements to the process of identification and closer monitoring of student progress, especially during the early stages of the intervention, might therefore serve not only those students with special needs but also those students whose needs are not serious enough to warrant *Reading Recovery*.

Generation and generalization of skills

TRANSFER TO THE CLASSROOM. As a stand-alone program, *Reading Recovery* can offer no guarantee that skills acquired during tutorial sessions will transfer to activities in the classroom. This is a goal toward which *Reading Recovery* tutors and classroom teachers must actively work. Mastery of skills in isolation is an important first step, but the child must also be helped to develop the ability to generalize, or to transfer those skills to dissimilar but related tasks in those settings in which he is required to function during most of the school day.

MAINTENANCE AND TRANSFER IN SUBSEQUENT GRADES. Where children have been successfully discontinued from *Reading Recovery*, practitioners still have to be concerned that, based on available evidence, treatment effects tend to diminish and even to disappear over time and that failure rates rise to match those of control children by Grade 4. Clearly, the bringing of entry level reading skills to average levels in Grade 1 does not always mean that contributing problems have been eliminated. It may be wise for practitioners to assume that, once children have been identified as requiring support, they will continue to require support in the future, particularly as the skills required for daily functioning become more complex. If discontinued children are to continue to thrive academically, then careful monitoring of progress in subsequent grades and selective supplementary intervention will have to be employed to ensure that acquired skills are reinforced and that the generalization of those skills is fostered.

Reading recovery in context

Reading Recovery teachers are trained, at least within the context of Marie Clay's model, to be proficient at diagnosing and correcting difficulties with emergent literacy. They also need to be encouraged to share aspects of their expertise with their colleagues. *Reading Recovery* teachers are not in a position to train their colleagues to equivalent and certifiable levels of expertise, but they are in a position to be able to identify and to demonstrate for them those aspects of *Reading Recovery*

that conform to best practice and to help them adapt those strategies for use in the classroom. Tutoring individuals who are at risk for early reading failure has been accepted as a worthwhile strategy. Now *Reading Recovery* teachers must reach beyond the tutorial and touch classrooms by helping to direct and improve current instructional practices.

The question of cost

Any intervention that is built on daily, half-hour, one-to-one tutorial sessions will stretch the budget of any school division, especially where all or most of the eligible children are being included in the program. Even though *Reading Recovery* targets only Grade 1 students, the cost of providing this service goes far beyond the resources of most school divisions in Manitoba. If the intervention is to be extended beyond Grade 1 into Grades 2 and 3, as many researchers are currently recommending, then the situation becomes truly impossible. Therefore if *Reading Recovery* is to form the basis for remedial programming in Manitoba and elsewhere, it will have to be modified to make it more cost effective. It may, for example, be possible to reduce training costs, to tutor small groups of two, three, or four students rather than individuals, and/or to train teachers to incorporate at least some of the diagnostic/prescriptive strategies into their daily lessons. Without these efforts or others like them, *Reading Recovery* will doubtless remain, at least for smaller school divisions in the country, nothing more than a utopian ideal.

CONCLUSION

As a strategy for helping students who are at risk for early reading failure, *Reading Recovery* has become the intervention of choice for many educators in North America. Both anecdotal and empirical evidence suggest that these professionals may have good reason to embrace Clay's (1985) model; yet, there are clearly problems that need to be addressed before the model can be accepted fully by the broader community of professional educators.

In the first place, the problems surrounding the identification of candidates for *Reading Recovery* require immediate attention. Students who require some help, but are not in need of intensive one-to-one tutorial sessions should be served in other ways. Similarly, alternative approaches need to be put into place as soon as possible for those students who do not respond to *Reading Recovery* or whose rate of responding is too slow to allow them to meet the expressed objectives of the program.

Secondly, students who manage to reach average levels of functioning and who are, therefore, able to be discontinued from the program obviously serve as evidence of the success of *Reading Recovery*. Within this group, however, there are those whose acquired skills appear not to generalize, as well as those who fail to develop the desired "self-extending system" for reading. The performance of these students in subsequent grades needs to be monitored, and, where necessary, additional support needs to be moved into place.

Thirdly, experienced, highly trained *Reading Recovery* teachers ought not to be allowed to function solely as tutors in a satellite program. They need to be encouraged to share their expertise with colleagues and to work toward improving the quality of programming in the classroom.

Finally, ways have to be found to reduce to manageable levels the costs that are associated with the training of personnel and with the implementation and maintenance of the program. At the present time, those costs are prohibitive for many school divisions, but they are especially so for smaller school divisions in rural and remote areas of Manitoba and Canada.

To sum up, the opinions of both researchers and practitioners strongly suggest that *Reading Recovery* is a valuable program which has much to offer in the way of best practice. Pragmatists, on the other hand, point to the serious problems, financial and otherwise, that accompany the implementation and maintenance of tutorial programs in general and of *Reading Recovery* in particular. For the proponents of *Reading Recovery* and many other concerned practitioners, the primary goal of the next phase of service delivery must involve finding some way to rationalize these two sets of conflicting forces, so that the maximum number of children who are at risk for early reading failure may benefit.

ACKNOWLEDGEMENT

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BOOK REVIEWS

ESSAY REVIEW

LANDON E. BEYER (EDITOR). *Creating Democratic Classrooms: The struggle to integrate theory & practice*. New York: Teachers College Press (1996). 171 pp. US\$20.95. ISBN: 0-8077-3518-3 (paper); 0-8077-3519-1 (cloth).

RENATE SCHULZ. *Interpreting Teacher Practice: Two continuing stories*. New York: Teachers College Press (1997). 154 pp. US\$18.95. ISBN: 0-8077-3558-2 (paper); 0-8077-3559-0 (cloth).

DANIEL R. MEIER. *Learning In Small Moments: Life in an urban classroom*. New York: Teachers College Press (1997). 162 pp. US\$18.95. ISBN: 0-8077-3626-0; (paper) 0-8077-3627-9 (cloth).

PRACTITIONER INQUIRY SERIES

The *Practitioner Inquiry Series* is a relatively new and expanding targeted series of volumes from Teachers College Press in New York City that is specifically designed to bring timely and topical issues to the wide-ranging and evolving educational marketplace. Under the general editorship of Marilyn Cochran-Smyth and Susan Lytle of the University of Pennsylvania, assisted by a small representative advisory board, this series clearly exemplifies a standard of practical professionalism and insight that is most refreshing to witness. According to the series' general editors, as stated in the Forward of the first volume in the series, the *Practitioner Inquiry Series* "will include teacher research, action research, participatory research, and related forms of inquiry in education by teachers, administrators, staff developers, teacher educators, and others."

To date, the *Practitioner Inquiry Series* consists of three exceptional volumes that have certainly provided a most intriguing and eclectic base upon which future volumes may build in a safe and collegial atmosphere. The current volumes in this series are listed above.

Landon Beyer has brought together seven young and somewhat inexperienced elementary and secondary teachers and has provided an opportune structure and framework within which they can share their experiences in attempting to deal with that illusive 'thing' called integration. Much space is given in the general educational literature base related to classroom practice to the notion of 'integrating theory and practice', and Beyer's several teachers share their struggles in an honest, forthright, and at times humorous manner. Mostly drawn from the elementary and second language ranks, these seven youngish professionals would not normally be considered a representative sample of teachers-at-large; however, they are indeed young professionals at the beginning of their careers and are perhaps much more representative of a new generation of thinking, questioning, and reflecting practitioners.

As an aside, I found the personal visions that emerged from the narratives to be most true-to-life. These teachers did not disguise their classrooms within a 'Pollyanna' balloon, but dealt with their students and their difficulties, and their own weaknesses, in a realistic manner that quite endeared them to me. These are honest to goodness beginning professionals seriously questioning what is going on in their classrooms and attempting to find humane and 'democratic' solutions to some very serious problems many of which have their origins outside of the classroom and even outside the framework of the teacher and the school. Yet, these neophyte professionals are internally struggling with their own views and attempting to combine these with the reality of the school situation such that their pupils will learn within what might be generally termed a 'democratic' landscape.

I was particularly enamored with the story of Ushma Shah who describes her family's somewhat negative reaction to her decision to become an elementary school teacher. One family member even implied that such a choice could only have been made due to some major academic deficiency. She forcefully noted in reply to these, and perhaps to all such nay-sayers:

My decision to become a teacher was not based in bad SAT scores, bad advising, or bad karma. My decision to become a teacher emerged from hope for a just world and broader commitments to democracy, equality, and social change. (pp. 42-43)

Shah juxtaposes her extended practice teaching experience, and the demands and constraints that such an experience entails, with her new-found supposed freedom of her own elementary classroom. The hard factors of reality have dented her shiny views somewhat, but she still

hopes and strives for a classroom in which she and her pupils may collaboratively and collectively learn:

Now. . . I have learned that these ideas were naïve and not rooted in an understanding of a 32-student, urban classroom reality. However, I have not abandoned the commitment to a more participatory and cooperative classroom. . . . I am learning that teaching students to take responsibility for their voices and actions is a process. (pp. 59-60)

Beyer closes his lengthy *Introduction* by asking readers to come on a journey of discovery and, to a certain extent as the solutions are unclear or unknown, to join his participants in their classroom as they grapple with some serious pedagogical and humanitarian issues. Beyer asks, and this invitation might well be applicable as a clarion call for the entire Series, "I invite you to join them in dialogue, struggle, and action" (p. 21).

Renate Schulz provides a most intimate view of two teachers via her narrative inquiry that is aptly entitled: *Interpreting Teacher Practice – Two Continuing Stories*. She sets an overriding tone for her effort when she notes that "teaching is a uniquely personal and intuitive activity that requires us to focus on its qualitative nature if we are to increase our understanding of it" (p. 1). In some detail, and drawing heavily upon the stories of her pair of participants, this two-year odyssey details the complex and real professional world of two secondary school English teachers. Somewhat in a contrasting fashion to Beyer's participants, both of Schulz's co-participants are what might be termed 'seasoned' professionals who have many years of successful teaching behind them. Additionally, they are far more secure in their knowledge base, their classroom mannerisms, and anticipated academic outcomes.

To me, the centrally intriguing position of Schulz's work is not that she documented via story, narrative, and interview two teachers over a long time frame. This would have been an interesting and worthwhile investigation in and of itself; however, what really sets this particular effort apart and makes it a thoroughly fascinating personal and professional drama are the reactions of one of the teacher co-participants. This particular teacher, contrary to what had been anticipated or expected, reacted negatively to what he read about himself and perhaps discovered attributes that he found out of sync with his carefully crafted self-image. In any case, essentially, Renata's book may be divided into three separate but interrelated sections, namely, (1) a set of descriptive "bookends", an opening and a closing if you will, which bracket the narrative descriptions and following discussion, and place them within

a philosophical framework; (2) descriptions, narratives, and stories of the two teachers; and finally, (3) an investigation into what Schulz terms "the pain of visibility".

It is this "pain of visibility" that provides a dose of dissonance to this study and, in a sense, signals an alarm bell that all educational researchers should heed. Notwithstanding the best of intentions, the constant feedback, and the numerous meetings, I think that we can all identify with co-participant Raymond's plaintive musings when he succinctly penned: "It's true, but that's not how I want to see myself" (p. 69).

By means of this ethical dilemma, Schulz is now able to take us on her own journey as she struggles with what she terms her "moral hypochondria" (p. 81). If this were a nonfiction account, then some final, positive or satisfying resolution would be provided; however, this is reality and there are rarely such neat and convenient ties and bows on these packages. Schulz provides a more meaningful and professional form of closure when she notes:

The narrative line of this story does not lead to closure, to a problem resolved. Rather, it leads to a situation revealed, an open-ended instance that invites questioning and further dialogue on confirming ways in which we can learn through teachers' stories. It is a text to be continued. . . . (p. 141)

John Sierra, a classroom teacher, presents the reader with a practical and realistic conundrum when he describes how he and Daniel Meier, the author of *Learning In Small Moments*, came to job-share or co-teach for a year. Many educators, I am sure, have toyed with the notion of team or collaborative teaching and some of us in teacher education facilities have perhaps envisioned some kind of temporary or part-time arrangement that would permit an opportunity to experience, once again, those special and almost indescribable sights, sounds, and tastes of an elementary classroom. However, how many actually forge ahead and deliberately spend a year in a split teaching situation? John perhaps summed up the hidden thoughts of many when he noted:

When Daniel and I decided to work together, we had little idea how quickly our differences would surface and how our personal and professional friendship would grow from these differences. We were different in education, teaching experiences, religious and family background, and social class. (p. xiii)

Daniel Meier has provided a marvelous insight into how two professionals worked and struggled together over a year as co-teaching colleagues with the same group of grade one children in an urban public

school. In many ways, this is also a tale of how resilient kids are and how children can quickly and genuinely adopt and adapt to different caring adults. Through many vignettes and first-hand accounts, Meier recounts the triumphs and the tragedies of this roller coaster year as seen primarily through the eyes of the two teachers as they interacted with the children as well as themselves.

While one may laugh at Foo Foo's animal antics, or marvel at the insight exhibited through individual student art work, or even appreciate the gentle and subtle competition between two professional educators as they vie for affection and acceptance from their pupils by way of carefully crafted personal class activities; however, it is to me the realistic and all too oft repeated story of Robert that strikes that heart-felt cord. For many long months and through several school suspensions, repeated conferences, and animated professional discussions, John and Daniel struggled to find ways to help Robert. At the same time, they attempted to make sense out of the maze of administrative, legal, social, and personal agendas that at times appeared to conflict and actually negate aid for this young pupil. Although engaged in a worthy and, some might say, noble battle, the teachers were largely unsuccessful in meeting Robert's intellectual, academic, and behavioral needs. Robert, however, did demonstrate that innate ability exhibited by many children to place events perspectively within their unfolding landscapes.

In a testament to the resiliency of children, the power of the peer world, and the attractions of our classroom, Robert never gave up on finding a place and home in our classroom community. Like all our students, Robert just wanted to have a friend. (p. 118)

Meier has indeed produced a reflective chronicle of the daily grind that is the primary classroom, but this is not a story of failures, faults, and defeat; rather, it is an uplifting account that explores the everyday dreams of adult and child as they intimately work together in that special place called school.

The Practitioner Inquiry Series, as these initial first volumes indicate, has met the high standards that were illuminated by the general editors. This Series will indeed unite and validate new groups of concerned classroom practitioners, and will most certainly give voice to those who have a desire to see the complexities of the teaching-learning paradigm explored by practicing practitioners in a more intimate and personal narrative manner.

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KIERAN EGAN. *How cognitive tools shape our understanding*. Chicago & London: University of Chicago Press (1997). 312 pp. US\$24.95 (paper) ISBN 0-226-19036-6.

Kieran Egan, a professor of education at Simon Fraser University, proposes an innovative theory of curriculum and teaching relevant to K-16 education. Central to his approach is his concept of five kinds of understanding ("cognitive tools"; see Figure 1) usually mastered in a particular order during a child's development. The ordering of these resources mirrors the history of the "discovery" and development of these kinds of understanding in human civilization; Egan's is the first serious recapitulationist theory in education since at least the early part of this century. The theory emphasizes literacy and the development of facility in the deployment of language-related competencies. He also champions the value of even earlier mastery (in the mythic phase) of oral language use ("Too often, literacy is taught without much regard for the richness of children's oral-culture background"). Each cognitive tool is associated not only with learning at a particular stage or age range, but rather can continue over the entire lifespan. Nevertheless, Egan assumes that there exists a phase of maximum potency of ability to acquire the particular mode of understanding, within a sequence that is ordered through a set of interacting factors that are psychological, epistemological, and cultural. Also, elements of each mastered cognitive tool are brought – albeit in a truncated and incomplete way – the growth of subsequent, more complex cognitive tools, so that the capacity to deploy a cognitive tool acquired earlier in the sequence remains latent in every adult.

Egan provides excellent suggestions for how to develop curricula and teaching methods that use and develop each of these kinds of understanding while also imparting important skills and knowledge to students. Among educators, Egan is perhaps best known for championing the use of story-telling as a central instructional tool, and the book describes (as do his previous works) ways in which story-telling may be incorporated appropriately into the teaching process.

Egan's work is scholarly and he builds his arguments from the work of a dizzying array of philosophers, theorists, and researchers (e.g., Socrates and Plato, Aristotle, Rousseau, Wordsworth, Darwin, Dewey, Vygotsky, Piaget, Bruner). He also attempts to integrate recent work in developmental neuroscience into his developmental approach; unfortunately, the strength of the bridge between education and neuro-

science has been roundly challenged (Bruer, 1997), and readers should approach his neuroscience claims with additional caution (an ironic approach to reading Egan of which Egan would undoubtedly approve).

I also harbor strong reservations regarding Egan's claims that aptitudinal differences between individuals are relatively insignificant; I believe that people differ widely in aptitudes, and that effective educational practice is sensitive and responsive to such differences. However, reading Egan has prompted for me questions such as whether individual differences in aptitudes might have their continuing impact through, say, somatic understanding, and that their impact in subsequently mastered forms of understanding might not be mediated through a somatic understanding that becomes progressively enfolded in these more complex forms of understanding. In a related vein, Egan correctly identifies a major problem of education as how to preserve the capacity for learning through a "generalized learning capacity" into adulthood; he centers on educating the imagination as a primary solution. Egan's assertions find some support in the aptitude literature that suggests that *g*, or general cognitive ability (and presumably related to Egan's generalized learning capacity), is in fact closely related to personality traits associated with imagination and openness (Carson, Stalikas, & Bizot, 1997). There exists little doubt that *g* is a useful thing to foster through education; it is extremely useful in modern life (Gottfredson, 1997). Yet *g* is not the only royal road to learning, as Gardner (1983) and others have pointed out. There exists a variety of specific aptitudes that may facilitate learning in particular domains; it is unclear that fostering the imagination is the best way to stimulate continued learning capacity associated with the various other specific aptitudes. It is also unknown whether fostering the growth of generalized learning capacity (read: *g*) might have the unintended consequence of inhibiting growth of some other more specific forms of learning capacity.

In spite of my reservations centering around Egan's treatment of aptitudes, I believe his theory is extremely important, and that it has implications beyond education per se. For example, I am in the process of adapting it to career education and career development. Through separate communication with Egan, I understand that only two schools (both in Australia) have attempted to explicitly model themselves on the grounds of his theory. I have attempted to develop a charter school using his theory as a model, and although the parents participating in the design of the charter school were enthusiastic about the ideas Egan sets forth in *The Educated Mind*, it has proved substantially more diffi-

cult to excite established education professionals (teachers and existing researchers) about the merits of his approach. I wish others more success in applying his ideas.

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FIGURE 1: Egan's cognitive tools, typical ages and grade levels, main features

Cognitive Tool	Ages*	Grade	Main goal	Main characteristics
Somatic	till 2	home	mastery of mimetic activities	mastery of physical activities, rhythm, and non-verbal appreciation of and representations of the world (both social and non-social aspects of the world)
Mythic	3-7	pre-K-1	mastery of oral language**	binary opposites in thinking, metaphors, stereotypes; child is socialized into the local culture through stories, myths, taboos; gains a sense of belonging and right and wrong
Romantic	8-14	2-9	mastery of literacy	acquire conventional skills and ways of getting along (permits access to wider literate community than possible through oral communication with local group); finer gradations in thinking (not just binary opposites); interested in reality (not just myth or metaphor); concerns with limits and extremes of human potential and performance
Philosophical	15-20	10-14	mastery of theoretic abstractions	concern with theories of the world and one's place in the world via the theories; gradually, less concern with facts than with the theories; greater and greater sophistication in modifying theories so as to account for or resist inconsistent facts

Cognitive Tool	Ages*	Grade	Main goal	Main characteristics
Ironie	21+	15+	mastery of refined re-flexiveness	questions ability to know things as true through any of the other cognitive tools, except perhaps somatic; skepticism ranges from extreme to more reflexive (skepticism turned on itself)

*These are rough ages.

**Although children are taught the alphabet and reading skills in this period, it also is important to continue to develop the mythical understanding. More information about Egan's theory and implications for education may be found at his website at <http://www.educ.sfu.ca/people/faculty/kegan/>. (This table copyright 1998 Andrew D. Carson, all rights reserved, except for fair-use associated with this single instance of publication, or through such reprints as authorized by this journal.)

ANDREW D. CARSON *Ball Foundation (Chicago)*

BRUCE PIRIE. *Reshaping High School English*. Urbana, IL: National Council of Teachers of English (1997). 107 pp. US \$14.95 (NCTE members \$10.95). ISBN 0-8141-5668-1.

Despite the diversity of history and practice found in the educational landscapes of school, college, and university, the consensus, to quote cultural anthropologist Clifford Geertz, is that the traditional boundaries that have separated the various disciplines and genres of knowledge are collapsing. English language arts, the language in which much of teaching-learning is negotiated across the curriculum, as well as a disciplinary field in its own right, stands arguably on the "front lines" of such a transformation to the way we think, teach, learn, and construct knowledge. English language arts teachers have become aware of the impact of collapsing boundaries upon their discipline in a variety of ways, although what to do about it can seem bewildering. In a sense, the question we ask is how to get a foothold in an apparently explosive, yet intricate landscape. Where does one begin the re-visioning process?

It is in the context of this compelling need that Bruce Pirie's lovely book, *Reshaping High School English* falls. Pirie is an intellectual and a practising Canadian English teacher who also has the very real gift of entering into a conversation with his reader, thus enabling him to ground some exceedingly complex issues and concepts in a clear, engaging style. The book is rich both in reference material and classroom histrionics. In the case of the former, *Reshaping High School English* offers the enquiring reader a gold mine of contemporary, timely books, on topics ranging from the predictable – literature, rhetoric, response, writing, narrative modes of thought, to the eclectic – theatre as socio-

Cognitive Tool	Ages*	Grade	Main goal	Main characteristics
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It is in the context of this compelling need that Bruce Pirie's lovely book, *Reshaping High School English* falls. Pirie is an intellectual and a practising Canadian English teacher who also has the very real gift of entering into a conversation with his reader, thus enabling him to ground some exceedingly complex issues and concepts in a clear, engaging style. The book is rich both in reference material and classroom histrionics. In the case of the former, *Reshaping High School English* offers the enquiring reader a gold mine of contemporary, timely books, on topics ranging from the predictable – literature, rhetoric, response, writing, narrative modes of thought, to the eclectic – theatre as socio-

cultural transformation, cultural studies, media literacy, the culture of teachers in a postmodern age, and semiotics. Pirie is a writer, and the weave of his text is handled with such dexterity that it never once sags under the burden of the sources he draws into his argument.

From his opening account of the impact of the first wave of change in the teaching of English in his career, told with the kind of circumspect intelligence and wit that signals the beginning of a very real book about teaching-learning, Pirie moves into the landscape in which most of the text takes place: the point where media education meets the teaching of English language arts.

. . . Surely, however, right near the center of an English teacher's job description ought to be an expectation that we will put into students' hands tools for understanding how texts work. . . The individual person can only be understood in reference to a location in a social web, a location described by a set of statements of sameness and difference. . . Similarly, the individual text takes its place within a cultural web of all the representations the reader has experienced, and this web grows by the addition of each new text. (p. 21).

The rest of the book is an embodiment of this web, an examination of the texts, contexts, and intertextualities that shape the English classroom of the 90s. As is the case for many practising teachers, Pirie's theory takes shape in the action of teaching-learning. This will make his book credible to even the most critical reader, since what he has to say is grounded in the fertile "messiness" of teacher among students, with professional books providing the necessary dialogue that all pedagogues need to have with their colleagues.

Additional strands of Pirie's web, translated into chapters and sub-chapters in the book include: interrogating the cult of the individual in English teaching (a necessary step in the re-visioning process, without which the notions of context and intertextuality become inadmissible); what our handling of literature implies about the place of the individual in society (" . . . As Dorothy and Douglas Barnes [1984] have noted, teachers 'brought up on the particular sensibilities of the English novel tradition' may find it difficult to see this individualist focus as a 'cultural choice, a choice, that is, from amongst alternatives. . . '"); the principle of textual "non-transparency" (Masterman, 1993); the role of audience in English language pedagogy; unlocking reading processes (a practical guide that considers the research of Patrick Dias, Wolfgang Iser, and Peter Elbow, within a context where the teachers are asked to consider that readers need to both get into and out of the literary text in order

to make sense of it, as well as to grow as readers); drama in the classroom as another avenue for exploring text, context, and intertextualities (with reference to Dorothy Heathcote and Augusto Boal); students as makers of culture ("... In one writing class, my students and I were comparing the way we easily call ourselves 'readers,' but are inhibited about proclaiming ourselves 'writers'..."); re-visioning the five-paragraph essay ("... I am haunted by David Buckingham and Julian Sefton-Green's [1994] study of one able student's essays written over three years of classes in English and in Media Studies. Their analysis of the student's work suggests that 'progress' in Media Studies means a widening and deepening understanding of the world and one's experiences of the world, while 'progress' in English seems to mean something much narrower, something more like getting better at writing English essays with their precise text-and-evidence protocols...").

The concluding chapter of *Reshaping High School English* carries the title, "Cultural Studies," and deals with the hypothesis that the next step in the evolution of English language arts education may well be to re-vision itself as cultural studies. The argument Pirie makes here is both astute and coherent: he is too experienced a thinker and teacher to overlook the fact that such a hypothesis is controversial. In the landscape of an "... English program founded on [the] awareness of positions and interactions within systems..." Pirie promotes the "... treatment of texts as constructions within intertextual webs, sponsored by institutions and interacting with audiences," the "study of our own complex situations as readers," a commitment to students as actively involved in cultural transactions, and an exploration of interactions between people, and between the verbal and non-verbal through drama. Acknowledging the critique of such a future launched by scholars such as Harold Bloom, Pirie responds: "... It is rather a recognition that textuality operates within thickets of knowledge and experience, and if we value understanding how that works, we can't afford to be focused in narrow absorption, sitting at the feet of verbal icons that we have set on pedestals. Ultimately, it is the machinery of textuality, not the individual text, that is our object of study."

Reshaping High School English is a thoughtful, intelligent book that is destined to become a classic in the next millenium. It will engage and delight readers who teach in secondary schools, colleges, and universities, as well as education students and those involved in literacy work, vocational education, and communication arts.

ABIGAIL ANDERSON *Ministry of Education, Quebec, Canada*

STEPHEN TCHUDI (ED.) AND THE NCTE COMMITTEE ON ALTERNATIVES TO GRADING STUDENT WRITING. *Alternatives To Grading Student Writing*. Urbana, IL: National Council of Teachers of English (1997). 307 pp. US \$22.95 (NCTE members US \$16.95). ISBN 0-8141-0130-5.

Most readers will be well aware of Stephen Tchudi's distinguished career as a pedagogue, author of books on English language arts and interdisciplinary education, and author of young adult books. *Alternatives To Grading Student Writing*, edited by Tchudi, is the outcome of NCTE's Committee on Alternatives To Grading Student Writing. The committee's mandate was to study this subject, and then to assemble its deliberations into material for a book.

The text is lengthy, and organized into sub-sections: background and theory, responding to student writing, classroom strategies and alternatives to grading student writing, and faculty workshops in alternatives to grading student writing. The contributors of the nineteen papers and six workshops that comprise the book are largely teachers at universities, and *Alternatives To Grading Student Writing* appears to be aimed at this market.

Tchudi's Introduction to the volume gives an account of the deliberations of the committee, together with his own personal quest for alternatives to grading the writing of students. It is in the latter context that Tchudi revisits the battleground of post-secondary grading, assessment, and evaluation, that is also a landscape of power and resistance for teacher and student, teacher and institution. Committee members organized response to writing, assessment, evaluation, and grading into a taxonomy, in which response offered the most and grading the least "degrees of freedom" to teachers. As spokesperson for the committee, Tchudi's definition of these terms is one of the clearest that I have encountered recently, although cleaning up the terminology does little to resolve the necessity of arriving at a mark in order to satisfy the demands of the post-secondary education system.

The articles that comprise the book are virtually unanimous in their condemnation of grading, based both on its inaccuracy to determine individual growth and development, as well as its role in turning sites of learning into regimes of power. Different articles both describe and support teachers as coaches, self-evaluation and peer evaluation as indispensable keys to learning, grading on the basis of merit and achievement, outcome-based education, and student portfolios. In addition, there are case studies of a writing course in England, of second language learners, of the developmental process of an undergraduate student, and

of a class that incorporated evaluation into their growth as writers. Articles are interspersed with "interludes": the reflections of individual teachers and students on working through issues in evaluation and assessment, and alternatives to grading. The final chapter presents a series of workshops, together with a complementary list of resources, for faculties who would like to look together at such issues as: developing intrinsic motivation, contract grades, using rubrics and holistic scoring, communication with parents and the public, and alternative assessment across the curriculum. This chapter is a nice touch, insofar as it takes the issues treated in the book into a field of potential action, rather than leaving them as objects for reflection.

On the whole, *Alternatives To Grading Student Writing* lacks the kind of energy and vision that I have come to associate with Stephen Tchudi. The problem is not that I expected definitive answers, but rather that the topic demands a wider field of vision than the committee was able to provide. For example, the work of critical pedagogy and women's studies should have been considered, insofar as there are texts available, that analyze the culture of power in schools and universities; in addition, it seems to me that committee members should also have studied classroom teachers in elementary and secondary schools, many of whom are scholarly in their use of portfolios, rubrics, coaching and working with parents. The book may, however, be a valuable addition to the library of university teachers who are curious about how alternatives to grading are being pioneered in American universities.

ABIGAIL ANDERSON *Ministry of Education, Quebec, Canada*

HENRY A. GIROUX. *Channel Surfing: Race talk and the destruction of today's youth. Toronto: Canadian Scholars Press (1997). 254 pp. \$39.95 (HC). ISBN: 1-55130-124-5.*

And where do intellectuals stand in relation to politics? . . . [T]hose who are mindful of the ties that link everything in this world together, who approach the world with humility, but also with an increased sense of responsibility, who wage a struggle for every good thing – such intellectuals should be listened to with the greatest attention, regardless of whether they work as independent critics, holding up a much-needed mirror to politics and power, or are directly involved in politics. (Havel, in Giroux, 1977, p. 137)

In *Channel Surfing*, Henry Giroux holds up the mirror to politics and power in an attempt to make visible the political, economic, and cultural conditions "that undermine democratic public life and take the

of a class that incorporated evaluation into their growth as writers. Articles are interspersed with "interludes": the reflections of individual teachers and students on working through issues in evaluation and assessment, and alternatives to grading. The final chapter presents a series of workshops, together with a complementary list of resources, for faculties who would like to look together at such issues as: developing intrinsic motivation, contract grades, using rubrics and holistic scoring, communication with parents and the public, and alternative assessment across the curriculum. This chapter is a nice touch, insofar as it takes the issues treated in the book into a field of potential action, rather than leaving them as objects for reflection.

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In *Channel Surfing*, Henry Giroux holds up the mirror to politics and power in an attempt to make visible the political, economic, and cultural conditions "that undermine democratic public life and take the

young. . . as its first victims" (p.38). The book is a collection of essays – new and previously published (and revised) – which critique the ways in which youth and race are represented in selected texts of the mass media. Giroux believes that mass media texts have a pedagogic function and that how youth and race are imagined in the media and imagined by the public contributes significantly to how society treats young people and racial minorities. So, he examines the representations of young people and blacks in a diverse set of media texts: a Calvin Klein advertising campaign, a variety of Hollywood films, mainstream magazines, journals, and television. It is Giroux's claim that there is "a growing demonization of youth and [a] spreading racism in the United States" (p.15) and a concomitant attack on and abandonment of the compassionate spheres of public life: public education, health care, social services. These serve to undermine and constrain the development of citizenship and democracy. Giroux calls on cultural workers and educators to ". . . address these critical issues and to once again assert that education for critical citizenship is, in part, about assuming responsibility and bearing witness, combining intellectual rigor with social relevance, and sustaining those public spheres where democracy can flourish and sustain itself" (p. 16). In the first section of the book, called "Fashion, Demonization and Youth Culture", Giroux examines how youth are scapegoated and commodified in the world of advertising ("Something comes between kids and their calvins") and Hollywood films ("Hollywood and the demonization of youth"). In the third essay ("Bashing the sixties: public memory and the lost hope of youth"), he deconstructs recent attempts by conservatives to "bash" the 60s as one of the strategies in the demonizing process and highlights how the results of this attack has led to the despair that is developing among large numbers of young people.

Section two, "Race, Media and Whiteness", examines instances of the larger social context that have helped shape the preceding conceptualizations and representations of youth. In "White Noise: racial politics and the pedagogy of whiteness", Giroux discusses and critiques the emergence of the new scholarship on whiteness. In particular he raises the problem that the new scholarship's characterization of whiteness lacks an understanding of the complexity of whiteness as a form of identity and cultural practice. In the same essay, he also provides an instance – the juxtaposition of two films, *Dangerous Minds* and *Sutures* – of an educational strategy for refashioning the meaning of racial identity in oppositional terms. Next, Giroux looks critically at the recent media hype over the rise of black public intellectuals in the

United States and the ways in which the topic has been represented in the, largely, white press ("in living colour: black, bruised and read all over"). Then comes a critical look at the racially divided response to the outcome of the O.J. Simpson trial ("Playing the race card"); and, finally, "Race talk and the crisis of democratic vision" in which he and Susan Searle elucidate race talk in the highly publicized book, *The Bell Curve*, and examines its reception and public success as "... symptomatic of the growing crisis of democracy and racial justice that plagues the United States."

As a media educator, I found this book a disturbing and hopeful book.

- Disturbing, because of the bleak portrait Giroux paints of a growing proportion of American – and Canadian, because we are a prime market for American cultural texts – youth and the thrust of responses to them and representations of them by a society moving increasingly to the right. Disturbing, because of the questions that bubbled-up as I moved through the book. As I read, I initially questioned his claim about the seriousness and extent of the problems he describes. I questioned, too, his selections of the media texts used to illustrate and analyze his claims and the extent to which they were representative. I questioned his, at times, almost inaccessible, prose; his, occasionally arrogant, readings of the texts; his condescension to other public intellectuals who all appear to have their shortcomings. Disturbing, too, because his call to educators to respond to the pedagogy of cultural texts by encouraging critical reading of media is "old hat" to media educators. Additionally, his plea for cultural workers to produce texts which challenge mainstream media, seems naive and hopeless in the face of the enormous volume of media texts produced by a handful of media conglomerates which actively promote "the dominant" ideology of America.

- Hopeful, because one of his strategies for resistance to this barrage of messages is to equip young people with the knowledge, skills, and space to produce their own radio and television programs, newspapers, magazines, films, and other forms of public art. Giroux's affirmation of faith in young people to represent themselves to themselves and others, and his own indomitable spirit and belief in himself as a public intellectual, provoked much thought and questioning in my mind and mitigated considerably the sense of disturbance I felt in reading the book.

WINSTON EMERY *McGill University*

SCOTT CHRISTIAN. *Exchanging Lives: Middle school writers online*. Urbana, IL: National Council of Teachers of English (1997). 147 pp. \$15.75 (NCTE members \$11.75). ISBN 0-8141-1643-4.

The focus of Christian's book is the Anne Frank Conference which grew out of the innovative work of the Rural Teachers Network of the Bread Loaf School of English (BLRTN) based in Middlebury, Vermont. BLRTN facilitated online conversations through a telecommunications network with teachers who, in turn, linked their students into the network.

Essentially, Christian's book describes the first three years of the Anne Frank Conference and how the process transformed views on teaching literature and writing. During this period, over 800 middle school students were involved in online discussions of the classic, *Anne Frank: The Diary of a Young Girl* and its connections to their own lives.

Christian felt he had always been consistent in creating a positive environment for his students to write. He goes on to state, however,

Teaching writing, at its most basic, is like agriculture: we can do our very best to prepare the field, to plant the seed, to nurture the plants, but there is much that is out of our control. However, we can learn from each crop how best to seek the highest yield, and online literary exchanges are a fertile field for nurturing strong young writers. (p.3)

Thus began the online literary exchange with teachers and students – a journey via the network that took his young writers to geographically diverse classroom settings across America from Alaska, New Mexico, Mississippi, and Vermont.

When Christian describes a conversation between two students – one in Mississippi and the other in Alaska, he comments, "In a sense, they are seated around a literary dinner table, three thousand miles in diameter, speaking, joking, face-to-face" (p.74). An excellent picture.

Christian provides the reader with guidelines on how to follow the process – a process free of educational jargon, but not without its risks when seeking to collaborate with others. As Christian opines, "Aside from the professional issues of experience, commitment, and so on, I think the best test for selecting teachers with whom to collaborate is a simple question. Ask yourself if this person is someone whose company you'd enjoy over dinner or at a movie, or while riding across the state to a conference; if you can answer 'yes' without reservation, chances are it will be a good collaboration" (p.38). Well expressed!

A fascinating aspect of this book is the extent to which a telecommunications network formed a "life link" with both teachers and stu-

dents as learners – from different teaching experiences, schools, and communities – in a non-threatening, life-like, compassionate, yet honest environment.

Some of the observations Christian makes about the students' writing are brilliant, such as students who revealed how their opportunity to talk about their community and neighbourhood to people from another background widened their own view of themselves and others. A peripheral bonus! What emerged in the samples of student writing was a "blossoming" of understanding oneself and the surrounding world – that "self-consciousness" that Anne Frank talked about.

Christian's effort and undertaking are great; however, if I have one criticism, it is that there is not concrete evidence about teaching students to correctly cite the work of others. One would hardly expect eighth grade students to know this unless they are taught how to avoid plagiarism, a lesson that has to begin as early as we demonstrate to students how to research topics.

Christian is to be congratulated for bringing his valuable work to the attention of educators and students alike. Further, his message is powerful. When we widen our vision and "connect" young writers across all boundaries to reflect on a specific piece of literature and relate this to their own life experiences, these writers find a real purpose for communicating. The end result is a greater understanding of ourselves and the world around us. What a creative process!

I found this work fascinating because I once did a research study on writing and creating a story on the computer; the general result was that the university students really didn't like composing on the computer and found it difficult to create spontaneous text. The reason I found Christian's book so compelling is that the students' writing was really putting into "keystrokes" their verbal responses – they were "talking", using their fingers on the keyboard. Their conversations were committed to writing, which is marvelous.

This was a refreshing and rewarding review for me because Christian's book is a report on the results of written responses from remote online reflections and reactions to the reading of a book written fifty years before – that of Anne Frank's *Diary*. Very revealing! A renewal of the three!

I recommend this book unreservedly.

HELEN AMORIGGI *McGill University*

PAUL AXELROD. *The Promise of Schooling: Education in Canada, 1800 - 1914*. Toronto: University of Toronto Press (1997). 155 pp. \$12.95 (paper), \$45.00 (HC). ISBN: 0-8020-0825-9 (cloth); ISBN: 0-8020-7815-x (paper).

Paul Axelrod's volume, *The Promise of Schooling*, is the inaugural tome in a new series from the University of Toronto Press. Entitled 'Themes in Canadian Social History', the books in this series are specifically targeted at undergraduate students and are designed to be a sort of middle-ground between specialized monographs and textbooks. Additionally, books in this series will be summaries of the main themes and provide the university reader with a general historiographical approach to the material.

The Promise of Schooling: Education in Canada, 1800-1914 purports to address several broad issues in the development of Canadian education. Clearly, public educational policy did not develop in a vacuum or in a uniform manner throughout Canada. Various regional and provincial conditions helped to form local education policy in different ways at different times for different political and social agendas. Axelrod has set himself a somewhat daunting task in attempting to cover such a wide ranging field – historically, geographically, as well as pedagogically – within the confines of some 126 pages of text. The author defines the limits of his work by posing six major questions; to wit:

- how extensive was schooling in the early nineteenth century?
- what lay behind the campaign to extend publicly funded education?
- what went on inside the Canadian classroom?
- how did schools address the needs of the Native students, blacks, and the children of immigrants?
- what social and cultural roles did universities serve by the beginning of the twentieth century?
- how were schools affected by the economic and social pressures arising from the Industrial Revolution?

Why was I left a touch unfulfilled and a bit unsatisfied when I finished reading this volume? The author had indeed dealt with the six major issues and had met the stated purposes of the series by providing a general and non-referenced running text that attempted to cover wide-ranging complex historical, political, social, and geographic material in a relatively simple and straightforward manner. Furthermore, the author appeared to take great pains to select a variety of material and

examples from all geographic areas of the country so that the book did not take on an 'Ontario first only and holy' kind of tone. Additionally, the potentially divisive issues of Native and visible minority education were tackled in a forthright manner and placed within their appropriate historical and social contexts. As well, the place of women within the expanding and evolving teaching profession itself as well as students within the university scheme was exposed to professional scrutiny.

Obviously, I am not an undergraduate education or history student and, therefore, not a member of the intended audience. However, sober reflection brought to the fore a number of issues that need to be addressed by the series editor such that future volumes do indeed meet the lofty aims that have been established. A few small particular irritants did stand out in my mind, such as, to discuss the deep religious roots and nature of the Newfoundland and Quebec school systems and make nary a mention, even via a brief and passing footnote, that substantive and fundamental constitutional changes were pending, strikes this reviewer as an oversight. Furthermore, the statement that Jews in Quebec in the nineteenth century were 'forced' to send their children to Catholic schools is questionable.

More importantly, in my view, is the almost complete lack of insightful narratives and vignettes that would provide contemporary framing and colour for the time periods and societal issues under discussion. Annie Leake and James McCurdy were two educators from the late 1800s whose stories could have formed a pivotal point for a discussion of gender roles, teaching techniques, training programs, classroom practices, and student enrollment, as well as school politics. Instead, a couple of passive, somewhat dry and all too brief third person narrative reconstructions left the reader hungering for more human contact. Similarly, at other points in this drama – for example, with Native students, girls attending church controlled boarding schools, and boys in apprenticeship situations – personal narratives would have provided that intimate link between the past and the present. Additionally, such narratives would have situated the memories of the past into a kind of personable framework that would have resonated, in my view, with the contemporary reader.

Lest I be too hard on this first volume of a new series, Axelrod does draw some universal themes to the attention of the reader and, thusly, allows the reader to see that current educational discussions are often replays of long standing issues that have weaved and intertwined themselves throughout our history. Axelrod notes that the central role or main

purpose of public schooling always seemed to be skewed by the points of view of the interest group making the claim. To some in the mid 1800s, accessible public education was a way to make literate the masses for emancipation; while others saw public schooling as the way to inculcate societal values and patriotism. Similarly, the reader is constantly reminded of how the twin issues of finances and politics appear to end up at the center of most discussions of educational policy regardless of the time frame or geographic location. Furthermore, the apparent discriminatory practices against women, Natives, persons of colour, and new immigrants can unfortunately be played out today with different characters in various communities.

Overall and taking into account my concerns in regards to historical accuracy and personal narratives, I feel that Paul Axelrod has presented a meaningful volume that fits a niche in the education landscape. Designed as a 'quick read' in order to provide an 'overall view' of a vast and complex span of time, *The Promise of Schooling* is a worthwhile addition to all professional and institutional libraries. Furthermore, for certain college and university introductory survey courses, this volume may well be an appropriate core text.

The Promise of Schooling deals with broad key educational issues over time and allows the neophyte reader an opportunity to make links between the distant and apparently isolated past and their present. As illustrative of one such possible connection, the president of the University of Toronto in 1884, Daniel Wilson, noted perhaps sarcastically that the government of the day rejected a separate college for women because "co-education is cheap" (p. 97). Ironically, I wonder if some contemporary bureaucrat will make a similar observation to a more immediate issue by noting that, and I hope that Mr. Wilson does not mind the paraphrase, "integration is cheap". I look forward to additional books in this series and trust that they will be able to grow and develop based on the strong foundation that has been laid by Paul Axelrod and *The Promise of Schooling: Education in Canada, 1800-1914*.

JON G. BRADLEY *McGill University*

BOOKS RECEIVED

The following is a list of books received by the MJE. Not all the books received can be reviewed, although reviews of some of these books may appear in future issues. We wish to thank all of the publishers who have sent us review copies.

Blades, D. W. (1997). *Procedures of power & curriculum change: Foucault and the quest for possibilities in science education*. New York: Peter Lang. 312 pp. \$29.95. ISBN 0-8204-3325-X.

Brannon, L., & Greene, B.M. (1998). *Rethinking American literature*. Urbana, IL: National Council of Teachers of English. 262 pp. \$26.95 (NCTE members \$19.95). ISBN 0-8141-4119-6.

Love, A., Drake, J., & Slavin, B. (Illustrator). (1998). *The kids' guide to the millennium*. (Ages 8-12). Toronto & Buffalo: Kids Can Press. 64 pp. \$16.95 (HC). ISBN 1-55074-556-5. \$9.95 (PB). ISBN 1-55074-436-4

Flinders, D. J., & Thornton, S.J. (Eds.). (1997). *The curriculum studies reader*. New York & London: Routledge. 362 pp. ISBN 0-415-91698-4.

Hickman, P., & Stephens, P. (Illustrator). (1998). *Animal senses: How animals see, hear, taste, smell and feel*. (Ages 7-11). Toronto & Buffalo: Kids Can Press. 40 pp. \$14.95 (HC). ISBN 1-55074-423-2.

Hodge, D., Stephens, P. (Illustrator). (1998). *Deer, moose, elk & caribou*. (Ages 5-10). Toronto & Buffalo: Kids Can Press. 32 pp. \$14.95 (HC). ISBN 1-55074-435-6.

Noël-Gaudreault, M. (Ed.). (1997). *Didactique de la littérature: Bilan et perspectives*. Quebec: Nuit Blanche Éditeur. 152 pp. \$24.00 (paper). ISBN 2-921053-79-9.

Mason, A., Vaculik, A. (Illustrator). (1998). *Mealworks: Raise them, watch them, see them change*. (Ages 7-10). Toronto & Buffalo: Kids Can Press. 24 pp. \$121.95 (HC). ISBN 1-55074-343-3.

Mason, A., & Boudreau, R. (Photographer). (1998). *Starting with science: Living things*. (Ages 5-9). Toronto & Buffalo: Kids Can Press. 32 pp. \$11.95 (HC). ISBN 1-55074-448-8.

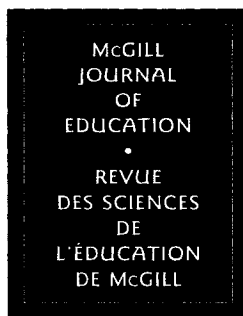
Moll, M. (Ed.). (1997). *Tech High: Globalization and the future of Canadian education*. Canada: Canadian Centre for Policy Alternatives (ISBN 0 88627 930 5) & Fernwood Publishing (ISBN 1 895686 92 X). 223 pp. \$19.95.

Patten, B.S. (1998). *The inside track: Getting hired to teach in a Canadian school*. Toronto: Thompson Educational Publishing. 236 pp. \$24.95 (paper). ISBN 1-55077-099-3.

Power, B.M., Wilhelm, J.D., & Chandler, K. (Eds.). (1998). *Reading Stephen King: Issues of censorship, student choice, and popular literature*. Urbana, IL: National Council of Teachers of English. 246 pp. \$19.95 (NCTE members \$14.95). ISBN 0-8141-3905-1.

Singh, R. (1997). *Grammar, language, and society: Contemporary Indian contributions*. New Delhi, Thousand Oaks, London: Sage Publications. 366 pp. ISBN 0-8039-9376-5 (HB).

Smith, S. J. (1998). *Risk and our pedagogical relation to children: On the playground and beyond*. Albany, NY: State University of New York Press. 220 pp. \$19.95. ISBN 0-7914-3594-6.



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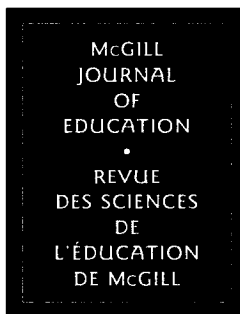
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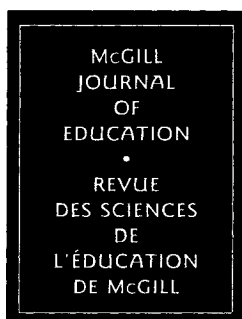
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