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The Effects of Streaming on the Self-Concept and Attitude of Primary School Pupils in Singapore

Quah May Ling

Introduction

When the New Education System — Primary (NES-P) was introduced into schools in 1980, pupils were streamed into three courses (Normal, Extended, Monolingual) according to the results of their Primary Three (P3) examinations. Streaming pupils to the three courses depends on their performance in P3 and P2. To be streamed into the monolingual or M-course, a pupil has to fail in P2 and P3. The end-of-year P3 examinations are school-based, but the items for the examinations are drawn from the item bank of the Ministry of Education (MOE). A safeguard against wrong streaming is the Ministry's achievement test, which is given to pupils identified for streaming to the monolingual course by their schools. So, M-course pupils would have failed repeatedly during their first three years of school.

The Case for Streaming

Singaporeans did not welcome streaming with open arms. The protests against streaming, strong and emotional, came from virtually every quarter. In adopting streaming in its education system, Singapore probably fell out of step with the rest of the world. For, while most of the other countries chose to mainstream their pupils, Singapore decided to segregate pupils according to academic ability — and to do so much earlier in primary school.

There were two main arguments against streaming. One was the deprivation of access to higher education for some children. The other was the social stigma of being streamed to the monolingual course which was termed to be "less academically-inclined". In the words of Dr. Soon Teck Wong, the former Director of Research & Testing at the MOE:

> Two major arguments were advanced against streaming. First, pupils streamed to a lower course, say the Monolingual course, would have reduced access to higher education. This argument derived from an egalitarian philosophy which did not recognize differences in human ability, thereby equating 'equality of opportunity' with 'equality of outcome' . . . Second, as errors in streaming could not be avoided entirely, a child wrongly streamed to a lower course would, in addition to becoming demoralized, suffer from the social stigma associated with the lower course. (Soon, 1988.)

There was much discussion on the issue of streaming by all parties concerned with the welfare of children. Many justifications were put forward by the Ministry of Education for adopting the streaming policy and perhaps the strongest one which its critics found hard to counter, was its quick results in bringing about a reduction in the rate of dropouts at the primary and secondary levels.

Before streaming was introduced, 20 percent of primary school pupils dropped out of school without getting any educational qualifications, while another 20 percent dropped out of secondary school without getting any secondary qualification. After streaming, the corresponding dropout rates were reduced to 10 percent for primary schools and five percent for

secondary schools only five years after streaming was introduced (The Straits Times, 29 Mar 1985). At the end of 1987, the MOE announced that less than one percent of students below 16 years old left school with fewer than 10 years of schooling (The Straits Times, 17 Oct 1987). Considering that Singapore does not have a policy of compulsory education, the low incidence of premature school leavers is remarkable. The same article cited post-streaming results which showed that the attrition rate fell from 29 percent before streaming to eight percent among the first batch of Primary Six pupils who underwent streaming while in Primary Three. Similar good results of streaming were found with secondary school students.

Self-Concept and the High or Low Achiever

Many educators believe that there is a significant and positive relationship between a student's concept of himself and his performance in school (Purkey, 1970). They believe that students who feel good about themselves and their abilities generally perform well in school. The reverse is also true. Educators believe that negative self-concept is also a significant factor contributing to low academic achievement in a substantial number of students (Muller and Leonetti, 1974). Gillman (1969) argued that the development of a positive self-concept is a necssary prerequisite to academic achievement and that the nurturing of a positive self-concept should be a major objective of schools which are concerned with the development of productive citizens.

Self-concept, as defined by LaBenne and Greene (1969) is "the person's total appraisal of his appearance, background and origins, abilities and resources, attitudes and feelings which culminate as a directing force in behaviour" (p. 191).

In a study investigating the differences between achieving and underachieving elementary school children, Durr and Schmatz (1964) reported that underachievers tended to lack self-confidence, a sense of personal growth, a feeling of belonging, and were more withdrawn. There were also signs of more behavioural immaturity and feelings of inadequacy in the group of underachievers. The finding by Durr and Schmatz seemed to be generally substantiated by the findings from Taylor's (1964) review of literature on personality traits and discrepant achievement which reported that the underachiever is, among other things, "self-derogatory, has a depressed attitude toward himself, has feelings of inadequacy, and tends to have strong inferiority feelings". However, in one of the studies (Holland, 1959) reviewed by Taylor, underachievers tended to have positive self-concepts.

In general, most investigators found that the achievers tended to have a more positive concept of themselves and of their abilities. Many empirical studies indicate a persistent and significant relationship between self-concept and academic achievement (Hansford and Hattie, 1982; West and Fish, 1973; West, Fish, and Stevens, 1980; Wylie, 1979). Brookover, Erikson, and Joiner (1967) tracked down pupils from grades seven through twelve in an effort to determine the relationship between their self-concept and academic achievement. They found that self-concept was significantly and positively related to academic achievement among boys as well as girls, and that this relationship was strengthened, when change in self-concept of academic ability was associated with change in grade point average. In a review of literature, Brookover and his team (1979) reported that school social systems might offer a potent source of explanation for school-level differences in pupil achievement. They postulated that schools could make a difference and interventions (Scheirer and Kraut, 1979) and school guidance programs (Khor, 1986) have positive effects on the self-concept of students.

Although some studies support the notion that high self-concepts in students promote high academic achievement, there are studies which do not. For example, Gilby and Gilby (1967) examined the effects of failure upon self-concept, and concluded that the stress of failure, caused subjects to experience lower self-esteem. Carlton and Moore (1966) studied culturally disadvantaged children to explore changes in self-concept as a result of academic success. They found that significant changes in self-concept occurred when subjects achieved higher academic evaluations. The researchers

concluded that successful experiences, more than any other variable, accounted for high self-concepts, rather than self-concept causing successful experiences. Although research data do not provide clear-cut evidence about which comes first, a positive self-concept or scholastic success, they do emphasize a reciprocal relationship between the two. Based on this interpretation of the evidence, it appears reasonable to assume that enhancing the self-concept will influence academic achievement and obtaining high academic achievements will result in the development of positive self-concepts.

Coopersmith (1967) reported that persons high in self-esteem approach tasks and people with the expectation that they will be successful and well-received. He also reported that persons low in self-esteem were more destructive and anxious. According to Erickson (1963), it was important for a teenager to ascertain his identity in each of his life roles, to find meaning in what he was doing and have a sense of self-worth. How he viewed and valued himself, either directly or undirectly, affected how he conducted himself, related to others, or coped with the demands made on him by others, at home, in school and in society. It would therefore be important to investigate how pupils viewed themselves as their perceptions of self could influence the way they felt about their academic work. This was particularly true of slow learners or low achievers who were commonly believed to have lower or less positive self-concepts compared to their brighter peers. Teachers of pupils with low concepts of themselves could then organize their classroom environment to help them improve their self-views.

Attitudes Towards School Subjects & the High or Low Achiever

Attitudes, like self-concept, seem to influence how well children will perform in certain activities. In this paper, the term "attitudes" refers to a system of feelings related to a particular activity or experience (in this case, learning) which causes a person/child to approach or avoid a learning situation.

Virtually every curricular programme has both cognitive and noncognitive goals. While a programme's cognitive effectiveness is routinely evaluated, the achievement of noncognitive objectives is rarely assessed (Hogan, 1975). Hogan cautioned researchers to keep in mind that "achievement is not highly correlated with affective reactions to curricular areas". It is possible, for example, that sometimes the results may show that some good readers express a strong dislike for reading, or some slow students seem to like mathematics very much. However, information about students' attitude towards school subjects will be helpful to the teacher planning instructional programmes, because student reactions to various activities in a curricular area can help determine how instruction in that area may be presented most effectively.

Grade level and sex differences in attitudes to English, Mathematics, Social Studies and Art were explored among a sample of students in grades seven through ten (Fraser, 1980). The results revealed that student attitudes were generally most favourable towards English, then towards Mathematics, Social Studies and (least favourable) Art.

Attitudes towards certain subjects may change as pupils advanced through the grades (Hogan, 1975). This hypothesis is supported in a study on the attitudes of high school students towards social studies (Fraser, 1981). The results found that attitudes towards school social studies declined with grade level among a random sample of 1,600 students in sixth through ninth grades in schools in a north central state of the U.S. Another study by Kaczala (1980) found that children became more pessimistic and negative about mathematics as they grew older.

A student's self-concept can affect his attitude towards school subjects. Since self-concept is not innate, but learned over a period of time, especially, through feedback from the student's significant others, a teacher is in a good position to contribute to positive self-concept development and maintenance (Quick, 1973). As Rosenthal and Jacobson (1968) in discussing teacher expectations for disadvantaged children said, the teacher may communicate his expectations to his students through "tone of voice, facial expression, touch, and posture".

Like the review of studies on self-concept, the relationship between attitude and academic achievement is mixed and inconclusive. While some studies seem to show a link, others do not. Perhaps part of the problem lies in the fact that attitudes, like self-concept, are sometimes outcomes and at other times, inputs.

Focus of the Paper

The literature on self-concept tends to show a link between academic achievement and a positive self-concept. However, not all studies agree that this is so. In Singapore, we segregate pupils according to academic ability and critics of this education policy are concerned that this may have a detrimental effect on the low achievers. This paper attempts to investigate whether streaming pupils into the three courses at a young age have affected pupils' self-concept and attitudes towards school subjects. Further, it attempts to investigate whether continued attendance at a less academically-inclined course like the M-course, has lowered the pupils' self esteem and increased their dislike of school.

Brief Background of the M-Course Programme

The twin objectives of the Monolingual curriculum are to inculcate basic literacy and numeracy and to develop personal, social and scientific awareness to ensure that pupils can relate efficiently and effectively to their natural, social and vocational environments.

To implement this new curriculum, instructional materials in the form of multi-level and multi-media packages incorporating teaching strategies which were described as being "a radical departure from traditional classroom practice" were developed by the writer leading a team of subject specialists and teachers. Staff development workshops and demonstration lessons were conducted to help teachers use the materials effectively in class.

These curriculum materials are activity-based and emphasized "learning by doing" (Quah, 1986). They are thus called the Learning Activity Programme, or LEAP, for short. Underlying LEAP are two objectives — that of providing pupils with a firm foundation in basic literacy and numeracy, and that of improving the self-concept and attitude of pupils toward their school work through the provision of enjoyable and successful experiences.

Method

In September 1985, nine months after pupils were streamed into the three courses, the Primary Self-Concept Inventory (PSCI) and the Survey of School Subjects (SSA) were administered to a sample of P4 children in the three courses to find out how they viewed themselves in terms of their self-concept and attitude towards subjects studied in school. All P4N, P4E and P4M pupils from four primary schools — one in each of the four zones of Singapore — were included in the sample. To minimise problems to schools, intact classes were chosen.

In all, the sample consisted of 582 pupils, with 204 P4M pupils, 171 P4E pupils and 207 P4N pupils. Of the total of 582 pupils, 334 were male and 248 were female. There were 393 Chinese, 158 Malay and 31 Indian pupils (Table 1). (Originally, there were 583 pupils but one Eurasian pupil was dropped from the

TABLE 1: PERCENTAGE OF P4 PUPILS GIVEN THE PSCI & SSA

	Mono (n = 204)		Ext (n = 171)		Nor (n = 204)	
	M(n = 129)	F(n = 75)	M(n = 102)	F(n = 70)	M(n = 104)	F(n = 103)
Chinese	12.2	7.4	13.6	9.6	12.4	12.4
Malay	9.1	5.0	2.4	2.2	4.6	3.8
Indian	0.9	0.5	1.4	0.2	0.9	1.6
Total	22.2	12.9	17.4	12.0	17.9	17.8

Mono = Monolingual Ext = Extended Nor = Normal M = male F = female

sample to facilitate the computation of the data.)

The PSCI was designed to serve two functions — to evaluate the effectiveness of educational programmes seeking to enhance the self-concept of pupils and to identify pupils who are likely to have undesirably low self-concepts. The test is designed to measure three major domains of intellectual-self, personal-self and social-self and may be scored to yield a total self-concept score. It has been suggested by the authors that a given domain score of five or higher or a total score of 14 or higher be used as an indicator of programme effectiveness (Muller & Leonetti, 1974).

The SSA was designed to measure pupil reactions to four major areas of the school curriculum: Reading and Language Arts, Mathematics, Science and Social Studies. One advantage of the SSA was that it did not require a pupil to do any reading. Means are about 22 out of a possible 30 and standard deviations are about 6.

The PSCI and SSA were administered to pupils on separate days but each test was given at one sitting. The results of the two tests administered to P4 pupils are presented in Tables 2 and 3.

One-way analysis of variance with "course" as the independent variable, was used to test for significant differences among the means obtained by the three groups of pupils at the P4 level. The Tukey test revealed that significant differences in social-self were between the means obtained by the M- and N-course pupils and between the means of the E- and N-course pupils. No significant differences existed between the means of the M- and E-course pupils (Table 2).

The results from Table 2 showed that M-course pupils thought more highly of their intellectual-self and personal-self than pupils in the two more academically-inclined courses, although the means did not prove to be significantly different. The M-course pupils had as positive a view of themselves as those in the other two courses, as far as success in school work was concerned. They probably saw themselves as a happy group of children who were not smaller in physical size or helpless as compared to others. In the domain of social-self, they had significantly lower concepts of themselves compared to the pupils in the brightest course (N-), but their social self-concept was not significantly different from pupils in the next brightest course (E-). They had as positive perceptions of their acceptance by their peers as did those in the E-course.

Although M-course pupils did not have significantly more positive concepts of themselves than the pupils in the E- and N-courses, they had, at least as high a self-esteem as those who were judged to be more academically inclined.

Results obtained in the SSA were also tested to find out if there were significant differences in pupils' attitudes towards Reading/Language, Mathematics, Science and Social Studies. Univariate analysis of variance using "course" as the independent variable, showed that significant differences were found in the means of Mathematics ($p < 0.0001$), Science

TABLE 2: MEANS, STANDARD DEVIATIONS AND F-VALUES OBTAINED BY P4M, P4E AND P4N PUPILS ON THE PSCI

		P4M(N = 204)		P4E(N = 171)		P4N(N = 207)		
Domain	MS	X	SD	X	SD	X	SD	F-value
IS	6	4.43	1.20	4.38	1.28	4.26	1.27	1.00
SS	6	4.03	1.39	4.25	1.24	4.80	1.32	18.32***
PS	6	5.64	0.85	5.53	0.87	5.54	0.99	0.83
TS	18	14.07	2.38	14.17	2.35	14.58	2.61	2.49

*** Significance level $p < 0.001$

Legend: IS = Intellectual-self SS = Social-self
PS = Personal-self TS = Total self-concept
MS = Maximum Score X = Means SD = Standard Deviation

TABLE 3: MEANS, STANDARD DEVIATIONS AND F-VALUES OBTAINED BY P4M, P4E AND P4N PUPILS ON THE SSA

		P4M(N = 204)		P4E(N = 171)		P4N(N = 207)		
Subject	MS	X	SD	X	SD	X	SD	F-value
R/L	30	25.14	5.63	24.74	4.75	24.19	4.80	1.78
M	30	26.58	4.84	25.14	5.43	23.82	6.08	13.03****
Sc	30	25.36	5.08	24.68	4.84	26.43	3.90	7.78***
SoSt	30	24.36	6.64	23.73	5.75	25.27	4.73	3.46*

Significance levels * $p < 0.05$ *** $p < 0.001$ **** $p < 0.0001$

Legend: R/L = Reading/Language M = Mathematics Sc = Science X = Means
Sost = Social Studies MS = Maximum Score SD = Standard Deviation

($p < 0.001$) and Social Studies ($p < 0.05$), but not in Reading/Language. The Tukey test revealed that M-course pupils had significantly more positive attitudes towards Mathematics than both the N-course and E-course pupils. In the case of Science, significant differences were found in the attitude of N- and M-course pupils, and between N- and E-course pupils. N-course pupils had the most positive attitudes towards Science, followed by the M-course, and then the E-course. There was no significant difference between the means of the M- and E-course pupils. In Social Studies, the Tukey test revealed that M-course pupils were more positive towards Social Studies than their brighter peers in the E-course. These results are presented in Table 3.

According to Hogan (1975), achievement is not highly correlated with affective reactions to curricular areas. He said that it was not uncommon to find that some low achievers might express high interest in one or more curricular areas, and high achievers might have generally negative attitudes, but have special interest in a particular area or sub-area.

The results presented in Table 3 tended to confirm Hogan's hypothesis. In this study, N-course pupils appeared to express the least liking for Mathematics, yet, they were the most able pupils of three groups. M-course pupils, who were the weakest academically, expressed the highest interest in Mathematics and the differences between the means of the three groups were very highly significant ($p < 0.0001$). A possible explanation was that M-course pupils found the LEAP Mathematics programme enjoyable. The materials were colourful and contained multi-media materials which included manipulatives and games which emphasize learning through concrete understanding. In addition, pupils were paced according to their attainment in the Survey tests administered before they started on the programme. Pupils were also grouped on the basis of their performances on these Survey tests, and pupils were given work in class which they could cope with. Diagnostic tests were given at the end of units of work and corrective/remedial measures were provided to ensure that pupils reached mastery level before proceeding to the next level. As such, M-course pupils probably found Mathematics learning less stressful and more enjoyable and experienced more success in class.

The same trend was observed with the means of the three groups for Reading/Language, although in this subject area, the variability in mean scores did not prove to be signficant.

The Science programme in the N- and E-courses emphasizes the learning of process skills, as does the M-course Science programme. The M-course Science programme does not follow the same syllabus, although most of the content areas are similar. The difference between the two Science programmes lies in the treatment of the content. The M-course Science programme deals with only basic concepts suitable for the "informed layman". Significant differences ($p < 0.001$) were found between the means obtained by the M- and N-course pupils and between the E- and N-course pupils. In the case of Science, the

brightest pupils had the most positive attitudes towards the subject and the M-course pupils were more positive towards Science compared to the E-course pupils, although not significantly so.

Social Studies is one of the subjects in the N- and E-course curriculum, although it is not an examination subject. However, Social Studies is not a subject in the Revised M-curriculum, per se, although aspects of Social Studies are incorporated into the Language Arts materials. N-course pupils were most positive towards this subject, M-course pupils were the next most positive and E-course pupils were the least positive.

Although M-course pupils were the weakest of the three groups of pupils, their attitude towards subjects like Reading/Language and Mathematics was the most positive of the three groups, and their attitude towards Science and Social Studies was better than that of the E-course pupils. These findings suggested at least, that M-course pupils did not dislike these subjects, but in fact appeared to enjoy learning them.

As the literature on self-concept generally showed a link between a positive self-concept and achievement, or vice versa (Gillman, 1969; Purkey, 1970), then, slow learning children, such as those in the M-course, exposed to frequent and repeated failure in the past, would most likely suffer from poor self-esteem. I was, however, convinced that if pupils were provided with a conducive learning environment, concerned and dedicated teachers and an educational programme incorporating sound pedagogical principles aimed at helping pupils overcome their past failures, these pupils could learn to improve their sense of self-worth. LEAP is a programme which attempts to help M-course pupils improve their self-concept by demonstrating to the pupils that there are many things in school that they can do and do well. I, therefore administered the posttest of the PSCI two years later on the P4M pupils who took the pretest. The results of the pre and posttest of the PSCI are presented in Table 4.

The pre and posttest results, using the correlated means t-test showing significant gains made by the M-course pupils after almost three years' immersion in the new programme, suggested that pupils' self-concept had improved. When these pupils were tested two years back, their social-self and total self-concepts were undesirably low. Two years after they had been in LEAP, their self-concept in three areas of self-concept (intellectual, social and total) had improved significantly. At the beginning of the programme, pupils already had positive personal concepts of themselves and although the posttest results showed some improvements, they were minimal. Using the authors' recommendation to regard a total self-concept score of 14 or higher as an indicator of programme effectiveness, it could be interpreted that LEAP was effective in enhancing the self-concept of the M-course pupils since the mean total self-concept score improved from 13.50 to 14.90 after two years.

It is frequently cited in the literature that achievement is linked to a positive self-concept (Hansford & Hattie, 1982; West & Fish, 1973; West, Fish & Stevens, 1980; and Wylie, 1979) and interventions can produce positive effects on self-concept (Khor, 1986; and Scheirer & Kraut, 1979). M-course pupils had experienced repeated failure in the past and many might even think negatively of themselves. If they were placed in another learning environment where success was experienced frequently

TABLE 4: MEANS, STANDARD DEVIATIONS & t-RATIOS OF THE PRE & POSTTEST OF THE PSCI

		Pretest		Posttest		
Domain	MS	X	SD	X	SD	t-Ratio
IS	6	4.27	1.22	4.78	1.13	4.99***
SS	6	3.94	1.41	4.60	1.35	5.50***
PS	6	5.34	1.07	5.50	1.03	1.75
TS	18	13.50	2.62	14.90	2.40	6.41***

Significance Level *** $p < 0.001$

through a more suitably paced instructional programme and provided with more appropriate learning materials over a period of time, it might be possible that their self-esteem would improve, and become as positive as those who experience success frequently. The pre and posttest results of the PSCI obtained by the M-course pupils in this study showed it was possible to do just that.

Conclusion

A comparison of the mean scores obtained by pupils of the M-, E- and N-courses in self-concept and attitude towards school subjects indicated that M-course pupils had as positive a self-concept and attitude towards the four school subjects as their peers in the two more academically-inclined courses after exposure to LEAP. The pre and posttest results of the PSCI showed that after three years' immersion in LEAP, the self-concept of M-course pupils had significantly improved. The results suggest that streaming pupils to a less academically-inclined course need not result in pupils losing self-esteem. Streaming on its own is not a negative practice. What is more important is what is done to help pupils after they have been streamed.

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