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**Evaluation Study
on the Implementation of
Medium of Instruction Grouping
in Secondary Schools
(1994/95 - 1996/97)**

**Educational Research Section
Education Department
February 1998**

Executive Summary

The Study

The study was carried out in response to the Education Commission Report No.4, published in 1990, which recommended that Secondary 1 entrants be grouped in terms of their ability to learn in Chinese or English and that regular reviews be conducted to monitor progress and to consider whether stronger measures may be required to achieve the objective of encouraging Chinese-medium instruction and minimizing mixed-code teaching. As a result, the Medium of Instruction Grouping Assessment has been implemented since 1994/95 school year under which all secondary schools are advised on the appropriate medium of instruction to adopt, based on the language proficiency of their Secondary 1 intakes. The major objective of this study was to gauge the effects of the different modes of teaching medium on the academic achievement of pupils. 219 target schools were divided into seven groups based on the mode of instruction and 56 of these schools with a total of 287 classes were sampled for the study. Each pupil of these classes was tested in one subject from Chinese, English or Mathematics and another subject from Science, Geography or History by matrix sampling. The cohort of pupils was tested again around the same time in 1996 and 1997 when they were in Secondary 2 and Secondary 3 respectively, so that a three-year effect could be drawn up.

Major Findings

2. Based on the analyses of the test results of the six subjects, it is found that mother-tongue teaching helps pupils achieve value-added performance in the subjects. This study does not support the general belief that attending an English-medium-instruction school would always help pupils achieve higher proficiency in the subject English Language. In general, pupils taught in English, especially those attending non-complying English-medium-instruction (EMI) schools, encounter a language barrier in expressing what they have learnt in the more language-loaded subjects, the subject History in particular.

3. Findings of the Questionnaire on Actual Medium of Instruction Used reveal that in all school activities, apart from school correspondence and non-academic activities which used mainly Chinese for all groups of schools, the medium of instruction used in non-complying EMI schools is different from that of complying EMI schools. For the non-complying EMI schools, mixed-code teaching is generally found. For the complying EMI schools, English is the main teaching medium.

4. Overall findings of this study support the policy stated in the Education Commission Report No.4 that the majority of pupils will benefit more from continuing their education at secondary level through Chinese medium of instruction. Pupils, those of lower academic ability in particular, would learn more effectively and achieve better results if Chinese is adopted as the medium of instruction.

Recommendation

5. The findings should be publicised widely so that parents and teachers are aware of the educational benefits of Chinese-medium teaching.

**Evaluation Study
on the Implementation of
Medium of Instruction Grouping
in Secondary Schools**

(1994/95 - 1998/99)

Educational Research Section
Education Department
August 2000

Executive Summary

The Study

This report describes the findings of an evaluation study that followed over 10,000 students in 56 secondary schools from Secondary 1 up to Secondary 5. Student level outcomes examined include academic achievement, self-concept and learning attitudes.

The study was first initiated in 1994 as a 3-year longitudinal comparative study of the academic achievement and learning process of junior secondary students in schools using different modes of teaching medium. The major objective of the study was to evaluate the implementation of “Medium of Instruction Grouping” in secondary schools and to consider whether stronger measures may be required to achieve the objective of encouraging Chinese-medium instruction and minimising mixed-code teaching.

The original 3-year study covering the junior secondary period was completed in February 1998. Results of the study indicated that:

- mother-tongue teaching helped students achieve value-added performance in the subjects of Chinese, Mathematics, History, Geography and Science; and
- attending an English-medium school did not guarantee students to attain higher proficiency in English language.

Details of the 3-year study were presented in the report “Evaluation Study on the implementation of Medium of Instruction Grouping in Secondary Schools (1994/95 – 1996/97)” published by the Education Department.

Based on research findings, the government issued the “Medium of Instruction Guidance for Secondary Schools” in August 1997. The “Guidance” stipulated that most secondary schools in Hong Kong should adopt Chinese for teaching all academic subjects, starting with their 1998/99 Secondary 1 intake. Schools wishing to use English must demonstrate that they have satisfied the requirements with regard to student ability, teacher capability, and support programmes for students to ensure that the use of English as medium of instruction (MOI) is beneficial to their students.

To monitor the implementation of the medium of instruction guidance policy, the original 3-year longitudinal study was extended to follow the same cohort of students up to Secondary 5. This report summarises the findings of this 5-year study.

Data Collected

In this study, schools were broadly categorised into 3 groups, namely the “EMI” group, the “Mixed” group and the “CMI” group. The EMI group were schools which used English as the medium of instruction, the Mixed group were those which selectively used English or Chinese as the medium of instruction by subject, and the CMI group were those which used Chinese as the medium of instruction.

Based on the grouping by MOI and the quality of their intake, 56 secondary schools were selected for the study through stratified random sampling. The cohort of about 11,000 students enrolled in Secondary 1 classes of these schools was followed from Secondary 1 to Secondary 5.

To assess the effects of the different MOI modes on students’ academic achievement, the fine grade points scored by students in the Hong Kong Certificate of Education Examination (HKCEE) were taken as the main output measure. At the secondary 1 to 3 levels, standardised tests in the subjects of Chinese, English, Mathematics, Science, Geography and History were also administered. To gauge other effects of the MOI modes, and to allow for better control of possible confounding factors, the following questionnaires were also used:

- The Learning Process Questionnaire
- The Questionnaire on Self-description
- The Questionnaire on Socio-economic Status (SES) of Students’ Family
- The Questionnaire on the Actual Medium of Instruction used in Schools

The first two questionnaires attempted to look at the effect of MOI on students' learning process and self-perception. The questionnaire on SES captured information on students' family background, and the questionnaire on the actual MOI attempted to validate the MOI actually used by the sampled schools against that claimed to be adopted by the schools.

Major Findings

Multilevel modelling technique was used as the main method of analysis. Developed from the school effectiveness research, multilevel modelling technique has been widely recognised as the most accurate and flexible tool for examining student attainment data to disentangle school effectiveness. By making use of the multilevel modelling technique, impact of the different background characteristics and treatment effects on students' academic achievement could be identified and separated. This enabled the net effect of the MOI modes to be correctly estimated whilst controlling for background factors such as students' age, sex, initial ability and family background, etc.

Table A tabulates the differences in the expected HKCEE performance attributable to the different MOI modes adopted by schools. In table A "EMI vs. CMI" indicate the difference between the expected performance of students in English-medium schools and students in Chinese-medium schools when all other factors were controlled to be equal. Similarly, "MIXED vs. CMI" indicate the difference in the expected performance of students in mixed-medium schools over students in Chinese-medium schools when all other factors were controlled to be equal.

Table A **Difference in Expected HKCEE Performance for Different MOI Modes in Terms of Fine Grade Points**

Group Differences (Fine Grade Points)	HKCEE Subjects					
	<i>Chi</i>	<i>Eng</i>	<i>Maths</i>	<i>Sci</i>	<i>Humn</i>	<i>Best 6</i>
Mixed Vs CMI	-0.59**	0.24	-0.11	-1.27**	-0.83**	-4.08**
EMI Vs CMI	-0.43**	0.34*	-0.03	-1.64**	-1.04**	-5.17**

- Note:**
1. The HKCEE fine grades obtained by students in each subject were transformed into grade points using the following conversion: A1 as 12, A2 as 11, B3 as 10 ... E10 as 3, F11 as 2, F12 as 1 and U as 0
 2. Asterisks indicate the significance level * probability<0.05; ** probability <0.01

For instance the difference reported for EMI vs CMI for Science subject was -1.64, this implied that after school and student level factors were accounted for, the expected Science subject grade points of students in CMI schools were 1.64 grade points higher than students in an EMI school.

From table A, the superiority of CMI schools over Mixed and EMI schools is obvious. Figures indicated that students in CMI schools performed significantly better than their counterparts in EMI and Mixed schools in the subjects of Chinese, Science, Humanities and overall HKCEE performance as represented by the Best 6 subjects grade point. There were no significant differences in the performance of the subject Mathematics across the 3 different MOI modes. And, in spite of the apparent greater exposure to the English language in Mixed and EMI schools, the advantage of EMI school students over CMI school students in the subject English was relatively small. Students in Mixed school had no advantage at all.

The expected overall HKCEE performance of students in Chinese-medium schools, as measured by the best 6 subjects total grade points, were on the average 4 to 5 fine grade points higher than their counterparts in schools adopting English-medium or mixed-code in teaching.

Impact of the MOI Modes over Time

To investigate the impact of the different MOI modes on the academic attainment of students at different stages of secondary schooling, analyses were replicated for students' attainment data in Secondary 1 and Secondary 3. Analyses results revealed that mother-tongue contributed to students' value-added performance in most school subjects throughout the entire secondary schooling period. Table B tabulates estimates for the differences in the expected performance attributable for the MOI modes adopted.

Table B Differences in Attainment in Standard Deviation Units in Secondary 1, Secondary 3 and Secondary 5

Subject	Chinese			English			Mathematics		
Level	S1	S3	S5	S1	S3	S5	S1	S3	S5
EMI Vs CMI	-0.04	-0.05	-0.16**	0.11*	0.19**	0.17*	-0.28**	-0.38**	-0.01
Mixed Vs CMI	-0.15*	-0.11	-0.22**	0.00	-0.03	0.12	-0.25**	-0.36**	-0.04

Subject	Science			Humanities					
Level	S1	S3	S5	S1 Geog	S3 Geog	S5 Humn	S1 Hist	S3 Hist	S5 Humn
Mixed Vs CMI	-1.1**	-0.97**	-0.49**	-1.20**	-1.21**	-0.36**	-1.45**	-1.18**	-0.36**
EMI Vs CMI	-1.4**	-1.05**	-0.63**	-1.34**	-1.26**	-0.45**	-1.48**	-1.11**	-0.45**

Notes: (i) Geog stands for Geography and Hist stands for History. From S1 to S3, papers on the subjects of Geography and History were administered. At Secondary 5, only the aggregate average of the grade points obtained for the Humanities subject group would be used for analysis.

(ii) * $p < 0.05$; ** $p < 0.01$

Examination of the figures in Table B indicated that, in general the negative effect of the MOI modes used in EMI and MIXED school persisted in the entire 5-year period. Patterns of the MOI impact over time varied across subjects.

For the subject Chinese, CMI school students performed better than their counterparts in EMI and Mixed schools. Although the negative figures were relatively small as compared with figures for Science and Humanities, the effect was seen to increase over time, indicating a gaining edge of CMI school students over EMI and Mixed school students.

For the English subject, there was no significant difference between the performances of Mixed and CMI school students. Although EMI schools had some advantage over CMI schools in the English performance, the difference was relatively small, and the effect was not seen to increase over time. This result does not support the general belief that the more the exposure to English, the better the students' development in the subject of English.

An interesting trend was observed for Mathematics, the negative effect observed for EMI and Mixed school was seen to increase from secondary 1 to secondary 3, and then decrease to non-significant values in secondary 5. Results suggested that EMI and Mixed school students had to cross over a language hurdle in the learning of mathematics. Apparently, students in EMI and Mixed schools needed to labour over some language barrier in early stage of secondary schooling. After surmounting the hurdle, they were able to perform as equals to their counterparts in CMI schools.

Negative effects of the EMI and Mixed MOI mode was observed to be incredibly strong for the Science and Humanities subjects. At Secondary 1, the expected performance of students in CMI schools was more than 1 standard deviation unit higher than their counterparts in EMI and Mixed schools. Although the negative effects did decrease gradually over time, the effects amounting to about 0.5 SD unit at Secondary 5 were still very strong.

Conclusions

Results of the Extensions study reaffirmed the findings in the previous study in 1994/95 – 1996/97. Results of the two studies indicate that mother-tongue teaching contributed to students' value-added performance in most school subjects throughout the entire secondary schooling period.

Underlying reasons for the superiority of mother-tongue teaching are plentiful, researchers worldwide had cited cultural, psychological and educational benefits of mother tongue teaching. In the local context, the Support Centre for Teachers Using Chinese as the Medium of Instruction and the Joint Working Group on Medium of Instruction Policy conducted two surveys respectively last year. Both surveys confirmed the positive impact of CMI teaching on students' learning. The use of CMI teaching was reported to have enhanced students' self-learning ability and confidence, stimulated higher order thinking, re-kindled students' interest and motivation in learning, improved student-teacher relationship and activated students' participation.

Regarding the impact of the different medium of instruction modes on students' learning process and self-concept, the differences found were predominantly small, and mostly not significant. Data collected in the study have not provided evidence for any conclusive deduction.

Recommendations

The findings of this study highlight the importance and effectiveness of Chinese-medium teaching and learning. Students learnt better and achieved better results if they were taught in their mother tongue. These findings provide solid support for the implementation of the firm guidance issued by the government in 1997 on the medium of instruction to be adopted in secondary schools.

Language in education has long been a controversial issue in Hong Kong. Although the benefits of mother tongue teaching have generally been recognised, many still perceive that avenues to further education or careers depend greatly on English proficiency and hence hold resistance against mother-tongue teaching.

After implementation of the MOI policy in secondary schools, there have been some changes in the views of both parents and school operators. Parents are now more receptive to mother tongue teaching, and CMI schools generally recognise the actual benefits of mother tongue teaching. To let the results speak for themselves, findings of this research should be publicised widely so that parents and teachers are aware of the educational benefits of Chinese-medium teaching.