Information Note

Legislative Council Panel on Education
Study on Small Class Teaching

Purpose

This information note summarizes the references we have drawn on in considering the Study on Small Class Teaching.

Background

2. In the discussion on the Study on Effective Strategies of Class and Group Teaching in Primary Schools (the Study) at the Panel meeting on 16 February 2004, Members requested the Administration to provide references of the research studies to which we have made when considering the Study.

Class Size Reduction Initiatives and Experimental Studies

3. The Administration has made reference to the following major class size reduction initiatives and experimental studies:

(A) Small Class Teaching in Shanghai **(上海小班化教育)**

a) It started in 1996 as a pilot scheme in 12 primary schools, involving 40 classes. Now, 39% of Shanghai's primary students are learning in small classes of about 30.
b) As resource allocation in Shanghai is district-based, the amount of additional resources for small class teaching and the time of provision of the additional resources, if any, vary by district.
c) The emphasis is on curriculum and pedagogical adaptation to maximise the benefits of small class size. Teachers of small classes are expected to :
   - prepare lessons with individual students' abilities and needs in mind;
   - mark individual students' classwork in their presence so as to give them immediate feedback;
   - adopt collaborative learning, group learning, peer discussion, etc.; and
   - design individualised learning targets, assignments and

assessments for students.

(B) Small Class Teaching in Taiwan (台灣小班教學精神計劃)

a) It forms part of Taiwan's Education Reform Plan of the Ministry of Education (教育部). The policy target is to reduce class size to 35 students, starting from P1 in 1998 to S3 by 2007.
b) The emphasis is on the *spirit* of small class teaching, *viz.* student-centred teaching and catering for individual students' needs.
c) The effectiveness of a school's implementation of small class teaching is evaluated externally by an inspection team comprising representatives from the Ministry of Education and district education administration, academics, school heads and teachers.

(C) Student / Teacher Achievement Ratio (Project STAR) (1985-1990, conducted in Tennessee, USA)

a) It was a 4-year longitudinal and experimental study of reduced class size from Kindergarten to Grade 3 (K-3).
b) Each participating school should have at least one of each of the 3 class types: small (13 to 17 students), regular (22-25 students) and regular with a full-time teacher aide (22-25 students).
c) Students and teachers were randomly assigned to the three class types.
d) Findings, which are subject to views and interpretations by other researchers, broadly include:
   - Students in small classes had higher performance than regular and regular/aide classes in all locations and at every grade level;
   - Small-class effects diminished after first grade;
   - The provision of 'teaching aides' (i.e. teaching assistants) was less effective than 'small class' in enhancing student performance at each grade level;
   - Mathematics and reading effects were similar; and
   - According to the Final Summary Report prepared by the STAR Project Team, overall, small classes helped raise achievement of both low socio-economic students and high SES students to comparable extent.
e) Follow-up studies on students' performance after they returned to regular classes showed that small classes in the early grades (K-3) produced significant long-term benefits throughout the high school stage. As compared to students from regular or regular plus aide

classes, students from small classes:

- completed more advanced courses;
- were more likely to graduate in the top 25% of their classes; and
- were less likely to repeat the same grade or to drop out of high school.

(D) Student Achievement Guarantee in Education (SAGE) (started in 1996 in Wisconsin, USA)

a) It is designed to increase the academic achievement of low-income children in Grades K-3 by reducing class size to 15 students, reforming the curriculum, providing professional development for teachers and opening schools to morning and evening activities.

b) Findings included:

- significant gains in reading and mathematics;
- greatest gains in first grade, which persist through third grade; and
- most beneficial to African-American students.

(E) Class Size Reduction (CSR) Programme (started in 1996 in California, USA)

a) It was a state-wide initiative to reduce the class size to a maximum of 20 students at Grades K-3.

b) A CSR Research Consortium conducted a state-wide evaluation of the Programme. Findings included:

- implementation lagged in schools serving minority and low-income students;
- relationship of CSR to student achievement was inconclusive;
- CSR was associated with declines in teacher qualifications and a more inequitable distribution of credentialed teachers;
- students in small third-grade classes received more individual attention, but similar instruction and curriculum; and
- classroom space and funds were taken from other education programmes to support CSR.

The references materials are listed in Appendix I.

Literature Review

4. The literature at Appendix II addresses the following questions related to class size: (i) whether “smaller” is better; (ii) what should be the

optimum class size; (iii) who benefits most; (iv) what makes the gains; and (v) how to maximise the benefits.

The smaller, the better?

5. Notwithstanding the evidences from Project STAR and SAGE, the benefits and cost-effectiveness of smaller classes have been challenged by the following studies:

(a) Eric A Hanushek (1) re-analysed evidences from Project STAR and argued that class size effects occurred primarily in kindergarten. He opined that rather than class size, it was teachers' quality that made the biggest difference.

(b) Caroline M Moxby (2) studied data from 649 elementary schools with small classes. She found that class size did not have a statistically significant effect on student achievement.

(c) Ludger WoBmann and Martin R West (3) analysed the class size and scores of TIMSS in 18 countries. Findings suggested that capable teachers were able to promote student learning equally well regardless of class size.

(d) Rob Greenwald, Larry V Hedges, and Richard D Laine (4) studied the effects of spending the same amount of money on various education initiatives. They found that investment in teacher development led to the highest improvement in student learning outcome, whereas improving teacher/pupil ratio was the least cost-effective.

The optimum class size

6. There is no consensus on the optimum class size. Peter Blatchford (5) conducted a longitudinal study of authentic classes at various sizes in England. The study suggested that, in mathematics, there were benefits resulting from decreases in class size across the full range of class sizes. In literacy, the size of class below which benefits were most marked varied according to the child's level of attainment prior to school entry. For the lowest attainers, there was a tendency for class size reductions to be most marked when the class size was reduced to 25 and less.

7. The American Educational Research Association (6) pointed out that

for maximum effect, the number of students in a small class should be from 13 to 17. Literature reviews [(7), (8) and (9)] generally showed that class size reduction should be down to 20 or below to produce significant effects. In practice, however, class size varies significantly among states in America. For example, at early primary years, the range is roughly from 18 to 25.

8. Some educators / researchers held that small class teaching might be implemented for some subjects or areas of learning [(7) (9) and (10)] instead of all lessons. For example, Maurice Galton (11) pointed out that while small class was preferred for learning activities involving more thinking skills and "learning through doing", students might not need so much attention from teachers during direct instruction on procedural knowledge. However, AERA (6) held the view that students should experience small class throughout the timetable.

9. In actual practice, different places define small classes differently, but in most cases, the reduction is a significant cut in class size. Under the Class Size Reduction Programme in California, the class size has been reduced from an average of 29 students per class to a maximum of 20 students per class. In Shanghai, "small class" refers to a class of about 30. In Taiwan, "small class" refers to 35 students per class. In both cases, the reduction is a significant drop from large classes of some 40-50 students.

Who benefits most?

10. Project STAR and SAGE clearly showed the benefits of small classes in the early years of education (K-3). Follow-up studies of STAR showed that the benefits could be sustained to higher levels when students studied in regular classes. SAGE showed that children from the socially disadvantaged families and minorities benefited most. Many other research studies and literature review conducted overseas in the past decades generally came up with similar conclusions. Some examples include:

(a) Peter Blatchford (5) found that class size effects were most obvious in the Reception Year.
(b) AERA (6) pointed out that to maximise the benefits of small classes, early intervention, viz. starting right from the kindergarten or first grade, was required. Besides, if resources were scarce, the focus should be on at-risk students.

(c) Peter Cuttance & Shirley A Stokes (7), Jeremy D Finn (8) and David C Illig (12) suggested small classes in the early years of education and for low-achieving or socially disadvantaged students.
(d) Other literature reviews also came up with similar conclusions [(9), (13) and (14)].

What makes the gains?

11. It is generally held that smaller classes allow more variety, breadth, depth, richness in learning and individualized attention, as well as fewer students to distract each other, easier classroom management and greater sense of achievement for teachers [(9) and (14)].

12. The study conducted by Linda Hargreaves, Maurice Galton and Anthony Pell (15), focusing more on classroom processes in small classes, showed that students were asked more often, challenged with open-ended questions and got longer period of teachers' attention. In his recent study, Peter Blatchford (5) found, through systematic lesson observations, that in smaller classes there was more likelihood of teacher support for learning, more active student involvement with teachers, less off-task behaviours but worse peer relation.

To maximize the benefits -- teachers' professional development

13. It is generally concluded that without corresponding changes in teaching and learning, reduced class size would have little impact on learning. However, teachers do not necessarily change their way of teaching when teaching in a small class [(7), (9), (13), (14) and (16)]. The Research Consortium undertaking the evaluation of California's CSR Programme found that students in smaller classes received more individual attention, but similar instruction and curriculum.

14. Peter Blatchford (5) pointed out that the benefits of smaller class would not flow in naturally. For example, small classes allowed more immediate feedback which, if not effectively managed, could become interruptions. He pointed out the importance of professional training to help teachers maximize the opportunities for individualized support and make productive use of other contexts for learning, particularly group work.

15. Many programmes that showed the positive value of small classes were launched in conjunction with teachers' professional development. SAGE and Texas's experiences are two of these examples. In Shanghai and Taiwan, the emphasis is not so much on the physical size of a class, but the spirit of small-class teaching (called "小班化教育" and "小班教學精神" respectively) where teachers' professional development and exchange of experience in small class teaching are strongly encouraged. In Texas, out of the 15 schools which had reduced class size to improve student achievement and attendance, only two were successful. These two adopted other strategies, including professional development of teachers and curriculum changes, alongside with class size reduction.

Final Remarks

16. Members are invited to note the references we have drawn on in designing our Study on Effective Strategies of Class and Group Teaching in Primary Schools.

Education and Manpower Bureau
June 2004

Appendix I

Key References:

On small class teaching in Shanghai ---

(a) 上海市教育委員會基礎教育辦公室, 上海市教育科學研究院普通教育研究所編著"小學小班化教育教學指南"

(b) http://www.shec.edu.cn
(c) http://xbh.yp.edu.sh.cn

On small class teaching in Taiwan ---

(d) 台灣教育部 "教育部中程施政計畫" (2000)

(e) http://class.eje.isst.edu.tw

On Tennessee's STAR ---

(f) Elizabeth Word, John Johnston, Helen Pate Bain, B DeWayne Fulton, Jayne Boyd Zaharias, Charles M Achilles, Martha Nannette Lintz, John Floger and Carolyn Breda (1985-1990) "Final Summary Report on The State of Tennessee's Student/Teacher Achievement Ratio (STAR) Project"
(g) Helen Pate-Bain, B. DeWayne Fulton, and Jayne Boyd-Zaharias (1999) "Effects of Class-Size Reduction in the Early Grades (K-3) on High School Performance"

On Wisconsin's SAGE ---

(h) "Smaller Class Size Raises Achievement, Study Finds" from website of National Education Association (NEA)
(i) Phil Smith, Alex Molnar and John Zahorik (2003) "Class Size Reduction in Wisconsin: A Fresh Look at the Data"

On California's CSR ---

(j) "What We Have Learned About Class Size Reduction in California" (2002) prepared by CSR Research Consortium comprising American Institutes for Research (AIR), RAND, WestEd, Policy Analysis for California Education (PACE) and EdSource
(k) Joan McRobbie (1996) "Smaller Classes Aim to Launch Early Literacy"

Appendix II

Research Studies and Literature Reviews

(1) Eric A Hanushek (1998). The Evidence on Class Size

(2) Caroline M Moxby (2000). The Effects of Class Size on Student Achievement: New Evidence From Population Variation, *The Quarterly Journal of Economics*

(3) Ludger WoBmann and Martin R. West (2002). Class-Size Effects in School Systems Around the World: Evidence from Between-Grade Variation in TIMSS

(4) Rob Greenwald, Larry V Hedges, and Richard D Laine (1996). The Effect of School Resources on Student Achievement, *Review of Education Research*

(5) Peter Blatchford (2003). The Class Size Debate: Is Small Better?

(6) American Educational Research Association (AERA) (2003). Class Size: Counting Students Can Count

(7) Peter Cuttance & Shirley A Stokes (2003). The Effect of Class Size on Teaching and Learning --- A Review of the Literature

(8) Jeremy D. Finn (2002). Small Classes in American Schools: Research, Practice, and Politics

(9) Reducing Class Size, What Do We Know? (1999) downloaded from www.ed.gov/pubs/ReducingClass/Class_size.html

(10) The Debate Over Class Size Part 2: The Critics Have Their Say (1998), downloaded from http://www.education-world.com/a_issues

(11) Maurice Galton (1998). Class size: a critical comment on the research, *Class Size and Pupil Achievement, International Journal of Educational Research*

(12) David C. Illig (1996). Reducing Class Size: A Review of the Literature and Options for Consideration

(13) School of Education, University of Nottingham (1996). Class Size Research and the Quality of Education" (Executive summary of a project commissioned by the National Association of Head Teachers)

(14) Education Resources Information Centre (ERIC) Policy Report on Class

Size, downloaded in 2002 from http://eric.uoregon.edu/publications/policy_reports/class_size

(15) Linda Hargreaves, Maurice Galton and Anthony Pell (1997). The effects of major changes in class size on teacher-pupil interaction in elementary school classes in England

(16) Ronald G. Ehrenberg, Dominic J. Brewer, Adam Gamoran and J. Douglas Willms (2001). Does Class Size Matter?

(17) The Debate Over Class Size Part 1: Class Size Does Matter! (1998), downloaded from http://www.education-world.com/a_issues

(18) Harold Wenglinksy (1998). The effect of Class Size on Achievement: What the Research Says, downloaded from http://www.ets.org/research/pic/memorandum.html

(19) Lance Izumi (1998). New Study Questions Effectiveness of Reducing Class Size, Pacific Research Institute

(20) Peter Blatchford, Harvey Goldstein & Peter Mortimore (1998). Research on Class Size Effects: A Critique of Methods And a Way Forward, *Class Size and Pupil Achievement, International Journal of Educational Research*