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A PULL-OUT GIFTED PROGRAMME IN SINGAPORE

Tock Keng Lim and Liang See Tan

Abstract

A variety of programming models, both part- and full-time, have been designed to provide gifted children with appropriate instruction to fulfil their needs and potential. In January 1993, The Chinese High School, an independent school in Singapore, started on a pull-out gifted programme where students are selected to attend a challenging, differentiated and enriched curriculum in Mathematics, Science and Computer Science. Interesting enrichment activities carried out in the programme included a Mentor Link programme and a creative computing camp. The strength of such a programming model is that while the gifted students are provided with opportunities for rapid progress and challenging activities within Mathematics, Science and Computer Science, they also have the opportunities to study and interact with their regular classmates and to be leaders in their regular classes. The pull-out gifted programme, as set up in Chinese High, was able to combine the advantages of both full- and part-time programmes. This paper presents the characteristics and activities of the pull-out programme.

Introduction

A variety of programming models, both part- and full-time, have been designed to provide gifted children with appropriate instruction to fulfil their needs and potential. In January 1993, The Chinese High School, an independent school in Singapore, embarked on a pull-out gifted programme where students are selected to attend a challenging, differentiated and enriched curriculum in Mathematics, Science and Computer Science. The gifted programme was part and parcel of the academic opportunities provided by Chinese High to facilitate the learning needs of its students. In its total commitment to educational excellence, Chinese High aspired to foster in its brightest and best students a sense of social and intellectual responsibility that would contribute to the general well-being and welfare of Singapore. The school was able to set up a gifted programme as it was an independent school in Singapore, run by a governing board. It enjoyed autonomy in staff deployment and salaries, finance, management and curriculum.

Chinese High was one of the few good prestigious schools in Singapore that the Ministry of Education encouraged to become independent in 1987. The Ministry felt the highly centralized control of the education system might have led to good schools in Singapore losing some of their individuality and special characteristics. Independent schools were established to serve as role models to the other schools and to improve the education system. Unlike private schools in the U.S. and the U.K., these independent schools in Singapore continued to receive substantial government financial support (Tan, 1993).

Setting up a Gifted Programme

After Chinese High became an independent school, it took advantage of its flexibility and autonomy to spearhead innovative programmes to cater to the needs, interests and aptitudes of its pupils. Special training for external Mathematics and Science competitions given in 1989 to students who were good in Mathematics and Science revealed that these students were highly gifted in Mathematics; that is, these Secondary 1 (Grade 7) students were able to solve mathematical problems as well as the Secondary 4 (Grade 10) students. A needs assessment in 1992 subsequently confirmed that these mathematically talented students required a special programme. Thus the gifted programme was launched in 1993.

There have been several programming models in the United States to provide gifted students with appropriate instruction to fulfil their needs and potential, with one of the earliest gifted programming efforts by Hollingworth (1926). She felt that bright children ought to be homogeneously grouped for curriculum enrichment as they could work two to four times faster than in a class heterogeneous in ability. Where opportunities permitted, the types of ability groupings explored for gifted students ranged from part-time pull-out programmes for students to work on activities not normally offered in the regular school curriculum, to full-time self-contained classes (Witham, 1991). The pros and cons of part- and full-time programmes were fully dealt with by Passow (1980) and VanTassel-Baska (1987).

Chinese High selected a pull-out gifted programme conducted within curriculum time. Unlike most part-time pull-out programmes where students worked on activities not normally offered in

the school curriculum, the gifted students in Chinese High attended a challenging, differentiated and enriched curriculum in Mathematics, Science and Computer Science in special classes within the regular school hours. They were only enriched in subjects that they excelled in. Such a pull-out grouping provided gifted students with opportunities for greater depth, rapid progress and challenging activities within these subjects.

In the special pull-out gifted class, students would find other students either equally capable or more knowledgeable than them. They would be able to develop a realistic appraisal of their own ability and measure themselves with appropriate yardsticks (Fiedler, Lange and Winebrenner, 1993). Studies by Feldhusen (1989), Kulik and Kulik (1984) and Oakes (1986) confirmed that gifted students benefited cognitively and affectively from working with other gifted students. Research on pull-out gifted models reviewed in Vaughn, Feldhusen and Asher (1991) indicated that these programmes have significant positive effects on variables such as achievement, critical thinking and creativity.

These gifted students were also given the opportunities to study their other subjects together with their own classmates in mixed-ability classes. They could interact with their gifted as well as their regular classmates. They learnt to face healthy competition from their non-gifted peers in their regular subjects. Some of them became role models and leaders in their regular classes; quite a few were involved in class committees while others became councillors. Additional enrichment was also conducted outside curriculum time.

Programme Features

Chinese High establishes the gifted programme as an integral part of its students' education to fulfil a number of objectives: to develop gifted students' abilities to the fullest through an enriched differentiated curriculum, to design learning activities at a higher level and pace, to develop gifted students into capable, productive and responsible individuals and to help gifted students gain a realistic self-concept. Every year, a group of about 25 Secondary 1 students is selected from the incoming cohort of about 300 students for the pull-out programme on the basis of their performance in a battery of tests in general ability and numerical and logical skills. Shortlisted candidates are interviewed together with their parents to ascertain their interest in and commitment to the programme.

A crucial component of the programme, as suggested by Feldhusen (1991), is the provision of a challenging and enriching curriculum in Mathematics, Science and Computer studies, extending the basic syllabus in breadth and depth. The Chinese High programme emphasizes ideas and themes within the enriched subjects using an interdisciplinary approach to curriculum design, as indicated in Witham (1991). Students highly gifted in mathematics use computer software to explore the concept of complex numbers and fractals. Teachers are encouraged to teach the students to use the computer to facilitate their learning. Higher-order thinking skills are emphasized and used in the classrooms. Questioning strategies are used to foster thinking in the classroom. This is in line with both VanTassel-Baska's (1991) and Witham's (1991) recommendation on the infusion of thinking skills into the core curriculum of the gifted.

Another important feature of the interdisciplinary approach to curriculum is individualised project work with mentors. Recent studies by Porter (1991) and Zorman (1993) pointed out that gifted students need to interact with mentors to achieve their potential. Chinese High set up Mentor Link within the gifted programme to assist students to locate mentors from tertiary and professional institutions to guide students in the specialised areas of their projects. This is in line with what is recommended in Maoz (1993): to utilize research institutions as special sources of knowledge to nurture talents. Secondary 1 students are taught research and scientific skills and guided by the school teachers in their projects. Secondary Two and Three students are given the opportunities to work with mentors in the tertiary institutions in projects such as fuzzy logic, defence science, plant tissue Culture, hydroponics, prime numbers, and robotics.

Secondary 1 pupils also go through a Creative Computing Programme where they learn computer skills within a short period of time. In this course, students simulate real life situation and write programmes using QBasic. During the annual Science and Technology Seminar (held in November) students attend talks in various topics given by specialists. Last year, the talks were on genetic engineering, plant tissue culture, research and development, mathematics magic, hands-on activities with Physics. In the annual seminars, students interact fruitfully with the speakers and many are stimulated by the talks to students to select their projects. All students activities in projects are recorded in a Talent Portfolio. The school is also well-equipped with resources such as a multimedia laboratory and a robotic laboratory to facilitate the gifted and other students in their research and project work. Students are also encouraged to use internet and the resources provided in international computer network (Beasely, 1993).

No programme could be successful if the socio-emotional well-being of students is not taken care of. Immediately after the selection each year, a teacher rating scale was sent to the primary school teachers to gather information and observations on the gifted students. This serve as the first step for the teachers to know the gifted students. The primary schools have proven to be very cooperative. Subsequently, information on self-esteem, attitudes in learning Mathematics and Science and thinking styles are collected (see section on Evaluation of the Programme). Periodically, the gifted specialist in the programme meet all students in groups to give them both support in their academic subjects and in socio-emotional aspects.

Orientation for Secondary 1 students, particularly the gifted students, is an important aspect of the programme. All students are orientated to adapt to the school and programme. Topic discussed include giftedness, handling comments from other students, time management skills, study skills, self-understanding, communication skills, interviewing skills and community service.

Teachers

Gifted programmes need effective teachers. Research by Feldhusen and his associates (Feldhusen, 1985; Feldhusen & Huffman, 1988; Hansen & Feldhusen, 1990) proposed that teachers need to have high general intelligence to match the abilities of the students, high level of mastery of their own discipline, high level verbal skills in reading, writing and speaking and strong intellectual orientation. Selection criteria of the teachers in Chinese High also included open-mindedness, flexibility, and enthusiasm and wide area of knowledge. Selecting appropriate teachers to fit all the necessary criteria are indeed hard to find. Every year, Chinese High attempts to assemble the best possible team of teachers for the gifted programme.

Staff development, both locally and overseas, is a vital aspect of the programme. All incoming teachers to the programme attend a 20 hour Foundation Course, with topics on understanding theories of giftedness, characteristics of gifted and talented, socio-emotional characteristics of gifted and talented, selection instruments and use of assessment, methodology and curriculum design. Teachers are trained to use internet, as well as curriculum software to aid their teaching. Classroom observations and discussions are part and parcel of the training and growth for teachers. There is also sharing of teaching materials among the teachers in periodical subject-specific discussions. All these strategies are part of the alternative training experiences to make staff development more meaningful to the teachers. To gain expertise from overseas, teachers are also sent to the States and other countries to attend international conferences as well as university courses on gifted. They are also attached for short durations to gifted schools overseas such as Bronx Science to observe teaching methodology and the gifted programme.

Evaluation of the Programme

At the initiation of the programme, a carefully controlled, broadly conceived evaluation study was planned to find out whether the programme would have significant positive effects on achievement, creativity and critical thinking skills of the students. The importance of having proper evaluation was pointed out by Callaghan (1993). Having surveyed the status of evaluation in gifted programmes in many countries, Callaghan concluded that programme evaluation had been a very neglected area in gifted education. When the Chinese High gifted programme was set up, evaluation became part and parcel of the programme. Evaluation was to both formative and summative: formative evaluation at the early stages to improve the programme and summative evaluation at the end of the year to determine the net effectiveness of the programme.

In the qualitative formative evaluation, classroom sessions were observed to see how students are responding to the lessons. Students and teachers gave feedback in both interviews and surveys on what they felt about the lessons, the enrichment activities and the programme. Students generally were in favour of the programme. Many of them did not perceive themselves to be gifted or special in any way. They did find topics within the enriched subjects to be challenging. Some students had come up with interesting projects and enjoyed working with their mentors (see Section on Programme Features).

A quasi-experimental design of an experimental class and a control class (both intact classes) was used for the quantitative summative evaluation. Instruments selected for the pre-tests included the Classroom Environment Scale (Moos and Trickett, 1974), Self Esteem Inventory (Coopersmith, 1981), Self-Description Questionnaire I (Marsh, 1988) and Test of Science-Related Attitudes (Fraser, 1981). Classroom learning environment and self-esteem scales were included to ascertain whether the programme could provide a better learning environment and enhance the students' self esteem. The post-tests had been carried out and the data is being processed.

Feedback from the teachers indicated that the programme appeared to be limited by the examination system in Singapore schools. Teachers in the programme were less willing to take the time to examine and try out open-ended methodology; they would rather stick closely to the syllabus for the examination. Chinese High would have to persuade the teachers to both cover and extend the syllabus for the enriched subjects in order to stretch the gifted students to their fullest. There is also a need to make the non-programme teachers aware of the characteristics and needs of gifted students.

Conclusion

The pull-out gifted programme, as set up in Chinese High, is able to combine the advantages of both full- and part-time programmes. Students are stretched in the pull-out gifted class in the subjects that they excel in. In their regular class, they are able to do their other subjects in the same pace as their non-gifted peers as well as to be able to interact with them. End of year results of students in the enriched subjects showed that gifted students did very well. They have also done well in Mathematics and Science competitions such as the Australian Mathematics Competition and the American High School Mathematic Competition. The teachers are generally happy with them. The programme aims to facilitate a total development of pupils. Currently the first batch of pupils is in Secondary 3. They would be sitting for their GCE-O Level Examination next year.

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