A TEACHER'S PERSPECTIVE OF THE GIFTED EDUCATION PROGRAMME IN SINGAPORE

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ABSTRACT

Through the provision of an enriched curriculum, the Gifted Education Programme (GEP) in Singapore seeks to meet the needs of pupils who are intellectually gifted. Pupils are selected at the end of Primary 3 based on their language, numerical, and general abilities. Having been involved with these pupils for about a year, thorough observation is identified as one of the several characteristics that these pupils possess. Some insights into the gifted pupils and the GEP structure in Singapore are shared in this paper.

INTRODUCTION

1.1.1 Prologue

The Gifted Education Programme (GEP) in Singapore was started in 1984 (Gifted Education Unit, 1995). Currently, there are five primary schools and four secondary schools offering the programme along side with the regular programme. One more primary school will be included into the programme in 1997. The total pupil enrolment in 1996 is about 1650 pupils (Tan, 1995).

1.1.2 Objective

The key objective of this paper is to highlight, from the perspective of a GEP teacher, certain key characteristics of the GEP students, and discuss some of the general implications of these characteristics.

1.1.3 Scope

The key discussions are based on observations and results of a survey of students in the mathematics class in a particular boys' primary school. However, a brief background information on the GEP is provided first.

THE GEP FRAMEWORK

1.2.1 Rationale of GEP

GEP was born out of a need to provide educational opportunities to the intellectually gifted students so as to enable them to develop to their optimal potential.

The intellectually gifted students have needs that are different from other students. They generally require a higher degree of mental
stимуляция. Исследования показывают, что регулярная образовательная среда не удовлетворяет эти потребности, и может издевательски, позволять талантливо одаренным студентам уклоняться в бездарность в своих школах.

Сингапур’s most valuable resource is its people. It will be to the detriment of the country if the talents among its people are not harnessed and cultivated to ensure its future growth and prosperity.

Thus, GEP exists to provide for the intellectual needs of the gifted students via its carefully tailored educational programmes and curriculum.

(Gifted Education Unit, 1995)

1.2.2 Goals of GEP

In view of the above rationale, the goals of the GEP are to:

a. develop higher level thinking processes commensurate with the child’s intellectual ability;
b. nurture creative productivity;
c. develop skills, processes and attitudes for self-directed lifelong learning;
d. enhance the child’s self-concept and aspirations for self-fulfilment;
e. encourage the development of a social conscience and a sense of commitment to contribute to society;
   develop leadership qualities.

From the above goals, it is apparent that the collective objective is to equip the students with intellectual tools and attitudes that will help them overcome the challenges of a dynamic society, and to help the students develop abilities and values that can be channelled towards effecting changes and progress for the good of the society and the nation.

(Gifted Education Unit, 1995)

1.2.3 GEP - the Selection Process

There are two entry points to the GEP - at the primary or secondary levels.

Primary school students are admitted into the GEP in Primary 4. Towards the end of their primary 3 education, all primary 3 students are invited to sit for Screening Tests which comprise a language ability test and a numerical ability test. Shortlisted students then sit for the Selection Tests which comprise a language ability test, a numerical ability test, and a general ability test. Based on their performance in the Selection Tests, students are invited to join the GEP.
Students from the primary level GEP form the bulk of the secondary level GEP intake. The rest of the students who enter the GEP in secondary 1 are selected from non-GEP primary students who graduate with 3 or more A* in the Primary School Leaving Examination (PSLE). They undergo Selection Tests (a language ability test, a numerical test, and a general ability test) which are pitched at a higher level than those administered to the primary 3 students. (Gifted Education Unit, 1995)

1.2.4 The Professional Development of GEP Personnel

Teachers are selected for the GEP after a process of interview and classroom observation. The qualities which the GE Branch looks for in a teacher include strength in subject content, creativity, flexibility and proficiency in teaching.

The selected teachers are then required to undergo a foundation course where they are exposed to the concept of education for the gifted, the principles of education for the gifted, and the principles of curriculum differentiation and affective education. This course is followed by a GEP Annual Conference whereby all GEP teachers attend workshops, review the GEP curriculum, and plan for the new academic year.

The training and development of GEP teachers takes place on the job. GE Branch officers help the teachers via developmental supervision and regular meetings which discuss matters relating to the GEP curriculum and teaching strategies. The GE Branch also organises courses that are conducted by GE Branch officers, gifted education specialists and overseas consultants. Examples of such courses are the Innovation Programme Workshop for primary GEP teachers, Basic Counselling Skills for Teachers of the Gifted and many others.

GEP teachers and officers are also sent on overseas attachments or sent to attend overseas courses. An example would be the National Association for Gifted Children Convention and school visits in Florida which took place in November 1995. (Gifted Education Unit, 1995; Tan, 1995)

1.3 GEP CURRICULUM

The GEP curriculum differs from the regular programme through enrichment in the following 4 areas:

- Content: the basic facts, concepts and skills are extended beyond the basic syllabus in breadth and depth, covering more advanced topics whenever necessary. The different subjects are integrated to allow the students to have a holistic view of the nature of knowledge. The
students are also encouraged to investigate real-life problem as well as examine the affective issues in the various subject areas. In recognition of the varying abilities among the gifted students, individual needs and interests of the students are given closer attention.

process: the students are taught higher-level thinking skills and provided the opportunities for discovery learning and open-ended problem solving. Research skills for independent study are also imparted to them. The teaching strategies are varied to suit the different learning styles of the students. The spirit of co-operation and teamwork are also nurtured through small-group activities and peer teaching.

product: the students are encouraged to investigate real-life problems, and to present what has been learnt in a variety of ways via creative expressions.

learning environment: a supportive and pupil-centred environment is provided to encourage risk-taking and the exploration of challenging tasks and ideas. Out-of-school learning experiences such as field-trips, mentorship and community services programmes are also provided.

(Gifted Education Unit, 1995)

Sections 1.3.1 and 1.3.2 provide illustrations of the above enrichment curriculum in the context of Primary GEP mathematics.

1.3.1 Classroom activities

The topic on graph taught at Primary 5 is used as the basis for the illustration.

In the regular stream, students are taught to read and interpret bar/line graphs, and to solve problems using data presented in the graph.

In the GEP, the students are further required to conduct experiments, tabulate the results of the experiments, and draw graphs to represent the results. In addition, open-ended questions that seek to stimulate their critical and creative thinking will be given. For example, students are required to choose from a list of sports (sky diving, golf, archery, snooker, swimming, long-jumping, javelin throwing, 100 meter sprint), the one that will give rise to the graph below. They are also required to justify their answer.
The gifted students are also required to investigate problems, and this involves identifying patterns and coming up with generalisation from the patterns.

1.3.2 Out-of-class activities

These comprise Maths Trail, Maths Camp, Maths Carnival and Maths competitions.

Maths Trail aims to provide students with opportunities to apply mathematical concepts outside the classroom environment, to their everyday life. Students who are grouped in threes to fives, have to "trail" a selected venue and work on a variety of problems. The problems range from approximations, like estimating the area of a carpark, to exact calculations, like finding the height of a flagpole using a clinometer. At the end of the activity, each group would share with their peers some of their problem-solving strategies, including the difficulties encountered.

Selected Primary 6 students from all GE schools participate in the Maths Camp activities. The camp activities comprise a Maths Trail, a Maths Relay that combine physical activities with maths power, quiz and problem solving, and a talk by an invited speaker.

The Maths Carnival involves Primary 6 students from all GEP schools co-operating within small groups to solve mathematical problems planned by the Secondary 3 GEP students.

GEP students are invited to compete in maths competition both locally and overseas. Local competitions include the annual Maths Olympiad organised by Chinese High school and overseas competitions include the International Festival of Mathematics of Daekyo (S. Korea) held in Seoul in June 1996.

1.4 GENERAL CHARACTERISTICS OF GEP STUDENTS

Based on observations and interactions with some GEP students for almost a year, it is noted that these students are generally very spontaneous in class as evidenced by their relentless inquisitiveness and eagerness to express their ideas. They also read very widely beyond the syllabus, and often display knowledge of things that are relevant and useful to classroom exercises and discussions.

a. In particular, the GEP students are very observant and thorough in their interpretations of problems put forward to them. The following maths question is used to illustrate this point.
The students were asked to answer the above questions. Instead of answering the questions at their face value, attempts were made to clarify the following assumptions:

All the pupils must join an extra-curricular activity.

Each pupil can only join one extra-curricular activity.

The students reasoned that without clarifying the above, they would not be able to answer part (C) of the question. To answer part (C), they must find the total number of pupils in primary 5, which cannot be conclusively determined without the above assumptions.

b. Also, the gifted students have so high a level of thirst for knowledge that they are willing to venture beyond what is required of them within the classroom. The following example illustrates this characteristic.

During a mathematical investigation, the pupils were asked to investigate the number of rebounds possible before reaching a corner and the finishing corners arrived at for rectangles (ABCD) of dimensions 2 cm \( n \) cm where 2 \( n \leq 10 \). They had to begin by drawing a diagonal line starting at corner A. For example, for the 2 cm \( 3 \) cm rectangle below, the number of rebounds is 3 while the finishing corner arrived at is B.

They had to make generalisation about the number of rebounds for rectangles of dimensions 2 cm \( n \) cm where \( n \) is even. They also had to make generalisation on the number \( n \) when the rebounds finish at corners B or D. After the investigation, some of the students, at their own initiatives, conducted further investigation that is beyond what was prescribed to them. One of them further investigated on the number of rebounds possible before reaching a corner and the finishing corners arrived at for rectangles of dimensions 1 cm \( n \) cm, 3 cm \( n \) cm and 4 cm \( n \) cm.

The above is just one of the many cases of students coming up with extension of problems or concepts to which they are exposed. Once the students are interested in or fascinated by a particular concept taught in class, they will find out more on their own or with their study group. They take pride in showing their teacher what they have found out.

c. It is noted that gifted students are also capable of coming up with "unconventional" methods of solving maths problems. This is an expression of their creative thinking. Given the following problem:
Mrs Lim paid $6.25 for 4 apples, 3 pears and 5 oranges.  
The cost of an apple and a pear was $1.15. 
The cost of a pear and an orange was $1.05. 
Find the cost of two oranges.

A conventional solution would be:

\[
(1.15 \times 1.10) = 0.10 \quad \text{an apple costs $0.10 more than an orange) }
\]
\[
(6.25 \times 1.15 \times 3) = 2.80 \quad \text{in step (2)}
\]
\[
(2.80 \times 0.10) = 2.70 \quad \text{in step (3)}
\]
\[
2.70 \times 3 = 0.90 \quad \text{in step (4)}
\]

In step (1), the value of an apple is compared to an orange. By elimination, the cost of 1 apple and 5 oranges was found in step (2). In step (3), taking away $0.10, which is how much more an apple costs than an orange, gave $2.70, which represents the cost of 6 oranges. In the final step, the cost of 2 oranges was determined.

However, one gifted pupil solved it as follows:

\[
(6.25 \times 1.15 \times 4) = 1.65 \quad \text{in step (1)}
\]
\[
(1.65 + 1.05) = 2.70 \quad \text{in step (2)}
\]
\[
2.70 \times 3 = 0.90 \quad \text{in step (3)}
\]

In step (1), $1.65 arrived at represents the cost of 5 oranges and a 'negative' pear. In step (2), the pupil added the cost of an orange and a pear to $1.65. Thus the value of $2.70 is the cost of 6 oranges and dividing it by 3 resulted in the final answer.

The student has good concept of negatives (though it has not been taught yet) and he was able to apply it to the above problem. He has used a creative method of solving the above question different from the others.

1.5SURVEY - RESULTS

A survey on mathematical learning carried out among 115 gifted students to find out how they felt about the GEP yielded the following results:

- 85% of the students feel comfortable with their workload in terms of the amount of homework given;
- 79% of the students are comfortable with the pace of the lessons;
- 82% of the students find the projects and assignment challenging;

The above results, though not conclusive, do give a rough indication that the GEP mathematics curriculum is successful in meeting the higher
intellectual needs of the gifted students.

1.6 DISCUSSIONS

As highlighted by observation (a) in section 1.4, the gifted students are very thorough and observant in their handling of questions. This alertness to details enable them to highlight issues that might appear trivial to students in the regular stream. Hence, the GEP teachers must exhaust their means to ensure that all problems and questions are not set ambiguously. Failure to do so may diminish the gifted students' faith in the GEP curriculum and staff, and thus affect the students' development to their fullest potential.

The second characteristic highlighted was the gifted student's self-motivation to seek further knowledge. This characteristic implies that the educational environment must be able to provide the time and avenue for such extensions, and that GEP teachers must possess the patience and flexibility to facilitate this.

Lastly, the creative ability of the students may be manifested in the way they present their solutions to maths problem. As such, GEP teachers should not limit students to any single method of solution. Doing so may risk some gifted students accepting that method as THE method, hence stifling creativity. It has always been the philosophy of the GE branch to encourage critical and creative thinking among students.

1.7 CONCLUSION

The observations discussed provide a perspective that might give an insight into the GEP in Singapore.

The GEP has generally been very successful in achieving its goals. With the GEP Branch's policy of continual reviews and refinement, the GEP can only get better.

REFERENCES:

8