

MATHEMATICS EDUCATION FOR THE GIFTED IN EGYPT

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This article provides a description of the status of the education of gifted students in Egypt in general and especially the education of mathematically gifted students. It explores some differences between world trends and the status of Egyptian educational policy for mathematically gifted students.

INTRODUCTION

Gifted students – who will be the creators and the leaders of the next generation – are the hope of Egypt in its advancement in keeping pace with civilization and progress. Consequently gifted education has been gaining interest and support by the Egyptian government. Thus it raised a banner of “learning for excellence and excellence for all”. Mathematics is the gate of progress of nations and can be the gatekeeper for many areas of advanced study, accordingly the interest in mathematics is more pressing than ever. Mathematically gifted students are distinguished from their non-gifted peers by their mathematical reasoning, their capacity for learning and their mathematical orientation. The Egyptian policy for mathematically gifted students’ education has some strong and weak features concerning definition, identification, appropriate curriculum instruction, assessment and teacher preparation, which I will outline in this article

HISTORICAL DEVELOPMENT OF GIFTED EDUCATION IN EGYPT

The interest in the education of gifted students in Egypt began at the beginning of the 19th century when king “Mohammed Ali” sent gifted students to Europe to study modern sciences and acquire advanced experiences in different sciences. In 1932 the Minister of Education established some special classes joined with a teacher training institute which was transformed later into a model school. Teaching in that school was based on “project method”. After the 1952 revolution interest in gifted education increased. In 1962 a ministerial decision established the special school for gifted students in Ain Shams “The Model School for Gifted” which is considered the only centre of gifted education in Egypt. In recent years the Egyptian government allowed to some civil society institutions to establish centres for developing giftedness and creativity but there are few links between these institutions and mathematically gifted students in schools.

A COMPARISON BETWEEN EGYPT AND ELSEWHERE

I now look at various aspects of gifted education I have gained from the literature and, for each aspect, comment on the situation in Egypt.

Definitions of gifted students

There are many definitions for giftedness. Ford and Grantham (2003) state that “most definitions of giftedness are IQ based and test driven” (p.218). The national curriculum in the UK defines gifted learners as those who have abilities in one or more subjects on the statutory school curriculum other than art and design, music and PE while ‘talented’ learners are those who have abilities in art and design, music, PE. In contrast a ‘gifted and talented’ student is defined by the State of Texas as one who “shows the potential for performing or performs at a remarkably high level of accomplishment when compared to other children of the same age, experience, or environment, and who exhibits high performance capability in an intellectual, creative, or artistic area, possesses an unusual capacity for leadership, or excels in a specific academic field.” (Texas Education Agency, 1996, 29.121).

In Egypt giftedness is defined as blessing from the creator to a few pupils which enables them to excel and perform better than their peers in special academic fields

Identification of the mathematically gifted students

Identifying gifted students is just the first step towards helping them achieve their full potential and early identification is essential for them. Smulny (2000) refers to the most effective way to recognize them and identifies giftedness as the use of a variety of approaches over an extended period of time. Schwartz (1997) suggests that schools can use the following methods in concert to ensure that all students receive a fair consideration: standardized tests such as intelligence, creativity and mathematics achievement and aptitude tests; observation and/or recommendations from teachers, parents and/or classmates; self identification, e.g. biographical inventories; portfolios as repositories of students’ potential or achievements. To avoid bias in the selection process, identification procedures should include a wide variety of measures to identify the broadest number of both females and males from diverse cultural and socioeconomic backgrounds. Sheffield (1999) suggests that measures might include any or all of the following: self-selection, observation of students during the problem-solving process; teacher, parent or peer recommendation; standardized tests; measures of creativity and/or problem solving; grades in mathematics classes; performance in mathematics contests; tests of abstract reasoning and measures of special reasoning.

In Egypt Identification of gifted students is based on the following conditions: students who get an overall score above 90% in the final exam of the end of the general preparatory certificate (GPC); psychometric test; creative thinking test (Ministry of Education, 1996). This identification strategy deals with both general giftedness and mathematical giftedness but the roles of teachers are not considered and neither are those of parents or peers.

Grouping – distribution and the gifted students

A critical issue in gifted students’ education is their distribution or grouping. Some views about this issue include questions of heterogeneous, homogenous or cluster

groupings. Allen (1991) uses the terms comprehensive, between-class, within-class ability grouping and specific subject areas. Stepank (1999) says that research on schools with inclusive classrooms shows that differentiated instruction is essential and is necessary in order to ensure equal opportunities for all students. Allen (1991) refers to the meta-analysis conducted by Slavin (1990) and Kulik & Kulik (1992) which show that ability grouping has essentially no effect on student achievement across ability levels and explains how gifted students show positive academic gains from some forms of homogenous groupings. Cluster grouping refers to a group of five to eight identified gifted students which are clustered in the classroom of one teacher and the other students in that class are a mixed ability cluster.

In Egypt programmes adopt a homogenous model where students who get the first order in the final exam of every area are grouped into the “Model Gifted School” in Ain Shams and when the sum of students who get an overall score above 90% in the final exam at the end of GPC is above 18, then the school puts them in a special class which is called “gifted class”. The inclusive model is not applied In Egypt.

Learning environments for gifted students

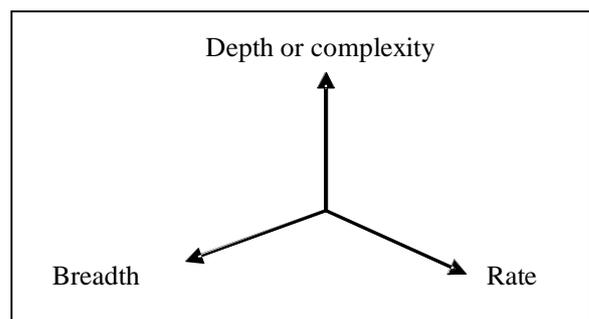
One of the first steps to consider when meeting the needs of gifted students is the classroom environment. According to Wheatley (1999) learning environments for gifted students should have the following characteristics: learner-centered rather than teacher or content-centred; independence rather than dependence emphasized; openness to new ideas, innovations and explorations; acceptance rather than judgement exercised; complexity rather than simplicity as a focus; varied groupings rather one grouping as a general organization; flexibility rather than rigid or chaotic structures; high rather than low mobility permitted and encouraged.

In Egypt there is a resource room, which contains computing facilities for all students. This can support gifted students learning but there is no special learning environment for mathematically gifted students.

An appropriate curriculum for the gifted

Mathematically gifted students have needs that differ in nature from regular students. They require some differentiated instruction in the depth, breadth, pacing, levels of complexity of content and curriculum materials.

Sheffield (1999) states that the model for the mathematics curriculum must take into consideration the depth of mathematics that is being learnt and the need to look at into a curriculum that provides challenges along at least three dimensions of learning: breadth, depth and rate.



In Egypt the mathematics curriculum provided at the gifted school is not different from that of ordinary schools except that teacher notes for students contain some activities and problems which require a high level of thinking to solve. Traditionally

taught lessons are considered inappropriate. There is no specific mathematics curriculum for gifted students.

Teaching gifted students

Teaching mathematics to gifted students differs from teaching it to regular students. Gifted students will respond to teaching strategies that focus on enquiry, problem solving and critical thinking.

In Egypt there is no guide for teaching mathematics to gifted students, in fact no guide exists for teaching mathematics to regular students.

Activities for the gifted

Schools identify and use in- and out-of-school extracurricular activities to challenge and motivate gifted students. Activities should have clear goals and should aim to increase pupils' ability to analyse and solve problems, stimulate originality and encourage initiative and self-direction. The most important activities for gifted are considered below.

Enrichment activities that supplement the curriculum, are generally not specified in it, and are selected by the teacher and/or students in a given classroom. Enrichment opportunities for the gifted should involve students in interaction with new ideas and topics. Enrichment activities include elements that (1) broaden gifted students' understanding mathematics by introducing innovative topics that go beyond the standard curriculum and (2) encourage meaningful insights and offer opportunities for gifted students to become a part of mathematics community (Keynes et al 1999)

In Egypt school timetables include a weekly lesson known as an activity lesson in which students choose the type of activity (maths-science-art-computers.....) they want to do. This slot can be utilized for enrichment activities for gifted students. Enrichment activities commonly associated with teaching gifted students are workshops and speakers' tours. Summer schools do not exist.

Acceleration refers to moving students up to a level/grade of study that matches his/her aptitude and mastery level in one or more curricular areas. Accelerated progression is viewed positively since it is a readily available educational alternative which can provide a challenging and satisfying environment without disadvantaging the student educationally, emotionally or socially (Merrottsy, 2003).

In Egypt schooling is divided into three stages and twelve school grades (primary, 6 years; preparatory, 3 years; secondary, 3 years). The Egyptian educational system supports the use of acceleration (grade skipping). Accelerated progression is possible at the end of the primary stage by sitting sixth grade exams a year early.

Mathematics competitions, whose purpose is to increase interest in mathematics and to develop problem solving ability through friendly competition.

In Egypt the Ministry of Education provides opportunities for gifted students to participate in competitions. In secondary schools the competition covers all subjects

(not just mathematics). Schools compete as teams in solving challenging problems. Egypt has participated in TIMSS since 1999. There is competition in primary schools conducted through cooperation between the Ministry of Education and Nile Educational TV.

Teacher preparation for the gifted

The teacher is the cornerstone in the educational system but there appears to be a lack in training teachers to deal with gifted students. Arguably all teachers who work with gifted students should have formal training. Such training should focus on testing and assessment, instructional strategies and models, social emotional needs and development and working with families (Ford & Grantham, 2003).

In Egypt, although teacher training courses now provide specialist preparation for teaching mathematics to gifted students, graduates of these courses have, in general, not been able to find work in teaching. In-service teachers continue to receive training in teaching strategies for how to help students solve questions in TIMSS competition but their experience and training regarding mathematically gifted students is lacking.

Assessing the gifted student

Assessment is necessary for gifted students because it provides them with an agenda for progress and enables teachers to plan future work to meet individual needs and to set appropriate targets. Gifted students benefit from a mixture of teacher and peer assessments.

In Egypt gifted students sit the same examinations as other students except in the first grade of secondary stage where they have an additional question in the final examination. This is usually marked for gifted students and does not count towards the final examination result.

CONCLUSION

The Egyptian educational program for gifted students has some strong features but it is seriously lacking in many aspects. On the strengths side there is a resurgent interest in preservice teacher preparation that deals with gifted students. Moreover academic research into giftedness has received considerable impetus in recent years. The adaptation of acceleration and enrichment is a noteworthy feature in the educational program as well as the encouragement to take part in national and international competitions.

With regard to weaknesses, gifted students are not systematically identified because no communication channel exists between parents, teachers and counsellors. Moreover no guide for meeting the needs of mathematically gifted student is available. Finally, there is very little link between schools and universities regarding the education of gifted students and the overall educational programme for gifted student is still in need of development, evaluation and refinement with most

mathematics teachers having limited knowledge of resources and limited time to provide challenging experiences for mathematically gifted students.

REFERENCES

- Allen, S. (1991) Ability-grouping research reviews: what do they say about grouping and the gifted. *Educational Leadership*. 48 (6), 60-65.
- Center for Gifted Education, (2004) Resource guide of mathematics curriculum materials for high ability learners, grades K-8. *The College of William and Mary*
- Ford, D. & Grantham, T. (2003) Providing access for culturally diverse gifted students from deficit to dynamic thinking. *Theory Into Practice* 42(3), 217-225.
- Keynes, et al. (1999) Building programs for promising students beyond the classroom. In L. Sheffield (ed.) *Developing mathematically promising students*. NCTM, 149-151.
- Merroy, P. (2003), The education of gifted in NSW – An Appraisal. *Australasian Journal of Gifted Education*, 12 (2), 18-27.
- NC in the UK Guidance on teaching the gifted + talented
<http://www.nc.uk.net/gt/general/index.htm> (accessed 29/4/2007)
- Ministry of Education –Egypt (1996) Ministerial decisions (No.114 at 1988, No.189 at 1990, No.143)
- National Council for Education Research, and Technology – Egypt (2000) *The national conference for giftedness*, 9-10 April Cairo. Ministry of Education
- Schwartz W.(1997) Strategies for identifying the talents of diverse students- ERIC Clearinghouse on Urban Education New York NY.
- Sheffield, L.(1999) Serving the needs of the mathematically promising. In” Sheffield (1999) (ed.), *Developing mathematically promising students*. NCTM, pp43-55. .
- Smutny, J.(2000) Teaching young gifted children the regular classroom.
www.hoagiesgifted.org/eric/e595.html (accessed 4/6/2007).
- Texas Education Agency (1996) *Texas State Plan for the Education of Gifted/ Talented Students*. http://www.professorlamp.com/ed/TEA/Tx_State_Plan.html (accessed 11/7/2007).
- Wheatley, H. (1999) Effective learning environments for promising elementary and middle school students. pp 71-80 in L. Sheffield (ed.) (1999), *Developing mathematically promising students* NCTM.
- Winebyenners & Devlin, B (1996) Cluster grouping for of gifted students www.iag-online.org (accessed 2/5/2007)