Differentiated educational programming and educational strategies for the highly gifted in the elementary schools of Malaysia

Norridah Katun

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Differentiated educational programming and educational strategies for the highly gifted in the elementary schools of Malaysia

Abstract
Highly gifted children, due to their unique attributes, need a differentiated program and educational strategies that are commensurate with their abilities. As a part of the educational reform movement, the country of Malaysia has committed itself to the implementation of innovative strategies for developing the potential of its children and youth. This review of literature focused on that commitment.

First of all, the need for differentiated programming and educational strategies for the highly gifted was reaffirmed. Then, from the reviewed literature, the qualities of successful differentiated programming/strategies were established for highly gifted children in the elementary schools of Malaysia. Third, six selected models/strategies for differentiation successfully used in the United States were examined, with salient features noted and possible modifications suggested for possible implementation in the Malaysian educational setting.

As a result of her analysis, the writer concluded that a feasible procedure for implementation might be the infusion of the six programs/strategies into a new entity that would meet the unique needs of the Malaysian children. Recommendations to ensure successful implementation also were presented.

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DIFFERENTIATED EDUCATIONAL PROGRAMMING AND EDUCATIONAL STRATEGIES FOR THE HIGHLY GIFTED IN THE ELEMENTARY SCHOOLS OF MALAYSIA

A Graduate Review
Submitted to the
Division of Education of the Gifted
Department of Curriculum and Instruction
In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

By
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Abstract

Highly gifted children, due to their unique attributes, need a differentiated program and educational strategies that are commensurate with their abilities. As a part of the educational reform movement, the country of Malaysia has committed itself to the implementation of innovative strategies for developing the potential of its children and youth. This review of literature focused on that commitment. First of all, the need for differentiated programming and educational strategies for the highly gifted was reaffirmed. Then, from the reviewed literature, the qualities of successful differentiated programming/strategies were established for highly gifted children in the elementary schools of Malaysia. Third, six selected models/strategies for differentiation successfully used in the United States were examined, with salient features noted and possible modifications suggested for possible implementation in the Malaysian educational setting. As a result of her analysis, the writer concluded that a feasible procedure for implementation might be the infusion of the six programs/strategies into a new entity that would meet the unique needs of the Malaysian children. Recommendations to ensure successful implementation also were presented.
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Dedication

For all the lovely people

My Husband, Jahari Ali, for his sacrifice and support

My children, Ira, Arief, and Aizad for their understanding

My dearest friends, Kelen and Al Panec, for their kindness and assistance
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Overview

Gifted and talented students have special learning needs that require special programs. As a result of those needs, the general curriculum needs to be adapted to suit their academic abilities. It is important that they should have access to content material not usually taught, as well as intensive involvement in areas of interest and advanced instruction (Van Tassel-Baska, 1989). This need for such a differentiated program also is reiterated by Davis and Rimm (1998):

Gifted and talented students have special needs and special problems; they also have special, sometimes immense, talents to lend to society. We owe it to them to help cultivate their abilities; we owe it to society to help prepare tomorrow's leaders and professional talent. Such students are a tremendous natural resource, one that cannot be squandered. (p.xi)

Tolan (1996) made an analogy between a caged cheetah in the zoo and highly gifted children in school. She stated that the school seems to provide a cage, giving the unusual mind no room to set up speed. She commented, “The highly gifted children sit in the classroom ... dull-eyed and silent” (p. 3). Like the caged cheetah, she warned, gifted children will underachieve. Her analogy tends to substantiate further the need for differentiated educational programs as an answer to the unfulfilled needs of gifted and talented children. This need is not unique to the United States. It is, rather, a global need and includes my country, Malaysia.

Malaysia intends to transform its educational system in line with, and in support of, the nation's drive to fulfill Vision 2020. This vision calls for a sustained, productivity-
driven growth which will be achievable only with a technologically literate, critically thinking workforce prepared to participate fully in the global economy of the 21st Century. At the same time, Malaysia's national philosophy of education calls for developing the potentials of individuals who are intellectually, spiritually, emotionally, and physically balanced and harmonious.

Malaysian elementary schools are organized into two phases. Phase I encompasses Year 1 through Year 3 (ages 7 through 9; grades 1 through 3). Phase II includes Year 4 through Year 6 (ages 10 through 12; grades 4 through 6). The schools do provide grade skipping for the able learners. First implemented in 1997, the grade skipping strategy is designed for Year 3 students (age 9, grade 3), who have excelled in the Assessment Examinations, the culmination point for Phase I elementary school. The integrated curriculum in this phase includes the Malay language, English language, mathematics, Islamic/moral education, music education and health and physical education. Many parents, however, do not take advantage of the grade skipping option. The major reason for not doing so is the fact that the foundation content areas are taught in Year 4. As a result, there is parental concern that, without Year 4 curriculum, their children would not be as likely to excel in the impending UPSR (Primary School Assessment Examinations).

Phase II of the elementary school is from Year 4 through Year 6. Students study the same subjects as in Phase I with the addition of science, living skills and social studies. (Malaysian Ministry of Education, 1994). The major reason for not taking advantage of grade skipping is the fact that the foundations of content areas are taught in Year 4; and parents are of the opinion that without the Year 4 curriculum, their children would not be
as likely to excel in UPSR at the end of Phase II. These all-important examinations cover the Year 4 - Year 6 inclusive syllabi, and excellent achievement is a virtual passport to placement in elite boarding schools and day care pioneer schools. It is apparent, then, that the concerns and apprehensions of the parents related to grade skipping also need to be addressed if the strategy is to be expanded.

Thus, while Malaysia is attempting to provide differentiated programming, it is from a limited perspective of grade skipping and is not yet accepted by parents as a feasible option. Thus, advocacy is essential to ensure the successful implementation of additional alternative programs for the highly gifted.

Statement of Problem

In a publication entitled *Strategic Planning -- Special Education 2020*, the Malaysian Ministry of Education (1995) stipulated that it is unrealistic to expect a gifted child to cope in a normal classroom setting without special assistance just as it is unrealistic to expect a disabled child to cope without integration and support. As in the United States, much has been done in Malaysia for the students at-risk at the one end of the continuum; but, at the end, programs for the highly gifted students are few in number. Teachers and other education officers have been, and still are, sent abroad to enroll in courses providing strategies for education of the blind, deaf, autistic and dyslexic. However, the highly gifted children's needs are being met, for the most part, by general education classroom teachers, most of whom have no special training in gifted education. Enrichment activities, if any, are generally an extension of the subject content area with
emphasis on drills and duplicated exercises as a reinforcement. Thus, it seems imperative
to provide differentiated educational programs to help facilitate learning and enable the
highly gifted to perform to their maximum potentials.

This review of literature will seek to address four questions: (1) Why is there a
need for differentiated educational programming for the highly gifted? (2) What would be
the qualities of a successful differentiated program for highly gifted elementary students in
Malaysia? (3) What are major curricular and/or educational strategies in the United States
that are considered to be successful models to differentiate programming of the highly
gifted? (4) Which of the United States models and programs should be recommended for
implementation in Malaysia, based on the established qualities?

Delimitations of the Study

With two exceptions (Gowan and Demos, 1965; Marland, 1972), this study was
limited to a review of the literature related to differentiated educational programs and/or
strategies for the highly gifted elementary students which were published from 1973 to
present. This was because significant research and related innovations were evidenced in
the curriculum of the gifted and talented during this particular era.

Definitions

For the purpose of this study, the following operational definitions are used within
the context of this research:

Differentiated Education Program: A course of study that is in some manner
different from the one to which students in the mainstream are exposed. Differentiation is not enough. To be appropriate, the curriculum for the gifted students must be defensible as well. Defensibility in this context implies that the curriculum is not only different from the norm, but educationally right for the gifted students (Borland, 1989).

**Giftedness:** Giftedness is asynchronous development in which advanced cognitive abilities and heightened intensity combine to create inner experiences and awareness that are qualitatively different from the norm. Such asynchrony increases with higher intellectual capacity. The uniqueness of the gifted renders them particularly vulnerable and requires modifications in parenting, teaching, and counseling in order for them to develop optimally (Columbus Group, 1991).

**Highly Gifted:** Highly gifted children are those who score above the third or fourth standard deviation of IQ tests. This incorporates a range extending from IQ 145 through IQ 180 and over (Webb, Meckstoth, and Tolan, 1982; Silverman, 1989, 1995).

**Methodology**

The writer conducted a review of literature in the following topic areas: gifted, differentiated program and/or educational strategies, and regular classroom using the ERIC database. As this produced a field of vast magnitude, two descriptors, highly gifted and academically gifted, were applied. A search of the Donald O. Rod Library at the University of Northern Iowa was instituted to locate books and journals which addressed the subjects of highly gifted, elementary school, middle school, special education, regular classroom, differentiated program and/or educational strategies, and curriculum. The
Internet also was used to access further information related to the education of the highly gifted. The search was narrowed by using the Lexis-Nexis system of the Rod Library. Additional sources encompassed bibliographies found in numerous books and journals examined as part of the research.

The writer outlined related topics for the research, thus enabling the accessed material to be duly classified. This was done by categorizing the literature according to the pertinent questions that needed to be addressed: the need for a differentiated educational program and/or strategies, qualities of a successful differentiated educational programming in the United States, and established qualities of successful differentiated programs. The literature then was analyzed by question; and, subsequently, recommendations were developed for the implementation of the successful programs in Malaysia, with modifications to suit the local context.

Review of the Literature

This review of the literature focused on elementary level and differentiated educational programs and/or strategies for the highly gifted. Specifically, it was focused on the determination of feasible and/or viable programs for implementation in elementary schools in Malaysia. The review attempted to answer the following pertinent questions: (1) Why is there a need for differentiated educational programs and/or strategies for the highly gifted? (2) What are the qualities of a successful differentiated program for highly gifted elementary school students in Malaysia? (3) What curricula and/or educational strategies in the United States are considered to be successful models of differentiated
programming for the highly gifted? (4) Which of the United States models and programs appear to be most feasible for implementation in Malaysia, based on the established qualities (Conclusions and Recommendations)?

The Need for Differentiated Educational Programs/Strategies

The highly gifted have an intense need for mental stimulation which differentiates them from their more moderately gifted peers (Lovecky, 1992a). This trait shows up early in life (Tannenbaum, 1992), catalyzed by high levels of curiosity and rapid learning rate. According to Tolan (1985), highly gifted children cannot concentrate on schoolwork that is dull; their minds take off on journeys that are beyond their control.

Unfortunately, far too many highly gifted students are “languishing in the regular classroom, unable to focus their attention on material that was mastered long ago, is unbearably simplistic, and has been reiterated beyond their tolerance level” (Silverman, 1995, p.200). Because highly gifted students learn at a faster rate than most students and because they can absorb and reconfigure more concepts, they benefit from a differentiated curriculum that is modified in both its pace and depth (Piirto, 1994).

Highly gifted students possess comparatively more complex needs than the average learners. For example, there is a need for variety in pacing, content, and complexity. Indeed, according to Clark (1996), if the needs are not met, the highly gifted ability will be lost. She further emphasized this when she stated:

Highly gifted students, those whose pace of learning, energy, vocabulary, concept development, and complexity of thought are significantly beyond advanced students, gain little from content and learning experiences, found in the regular
classroom. Often they become either isolates or underachievers when no appropriate programs are provided. When no programs are available to this group of learners, disservice is done not only to these students but to all of society, as our finest minds not only lack nurture, they are wasted. (p. 60)

Telferd and Sawrey (1981), too, emphasized the importance of educational achievement. They stated, “The highly superior can make considerable and significant contributions to the culture, and it felt that they must become educated to a relatively high degree to maximize their productivity. . .” (p. 21).

Experts in the field of gifted education have argued that no highly gifted child is born with ready knowledge. All a highly gifted child possesses is the potential to achieve intellectual excellence. Like every child, he or she has to be taught. In fact, it is probably true that the more gifted a person is, the more he or she differs from others in both kind and degree (Silverman, 1995). Van Tassel-Baska (1988) delineated three ways in which highly gifted learners differ: their capacity to learn at a faster rate (cited in Keating, 1976), their capacity to find, solve, and act on problems more readily (cited in Sternberg, 1985), and their capacity to manipulate abstract ideas and make connections (cited in Gallagher, 1985). Sizer (1984) specifically stated: “That students differ may be inconvenient, but it is inescapable. Adapting to that diversity is the inevitable price of productivity, high standards and fairness to the students” (p. 194).

Tolan (1985) uses the analogy of an elephant which eventually died of malnutrition as it was fed one blade of grass at a time. Likewise, the highly gifted child did not even realize that he or she was being taught because the level of instruction was not
Van Tessel-Baska (1994) identified two issues in relation to the education of the high ability learners:

The differentiation for these learners . . . emanate from a clear understanding of the capacity of such learners at a given grade level to engage in a faster pace of learning at an advanced level. Moreover, high ability learners require access to more sophisticated curriculum treatment at earlier stages of development. Consequently, curriculum expectations for these students need to reflect such adaptations, at advanced and even world class levels. Curriculum grounded in intra- and interdisciplinary concepts and higher order thinking skills, however, provides much greater opportunities to enhance learning for highly gifted students. (p. 33)

Gardner (1997) noted that studies of high-achieving youngsters document the effect of the enormous amount of support given by various parties, including teachers. He stated that no one, no matter how highly gifted, can forge ahead alone. It is, he said, a "rage to learn", reinforced with positive support, which has helped the highly gifted to succeed in their pursuit of excellence. Thus, it will appear that many children who are highly gifted may not attain success on their own. Unfortunately, some become dropouts (Marland, 1972), some become delinquents (Seeley, 1993), some become counseling problems (Sanborn, 1979), and still others become underachievers (Gowan & Demos, 1965).

While most of the reviewed literature established differentiated curriculum as a
need of the highly gifted, it must be noted that such programs are not without criticism. Oakes (1985, with the publication of *Keeping Track: How Schools Structure Inequality*, criticized the grouping practices of American schools; and, in *Educating the Ablest: Programs and Promising Practices* (Cox, Daniels, & Boston, 1985), negative evaluation of the rapid pullout enrichment programs that the authors characterized as having seen their day was explicitly espoused. In *The Manufactured Crisis*, a 1995 defense of American schools, Berliner and Biddle also attacked gifted programs as elitist and biased.

Thus, the literature seems to indicate two diverging opinions related to differentiated programming for the highly gifted. On one side of the debate are those who contend that highly gifted students should receive their education exclusively in the general education classroom from the general education teacher (McDaniel, 1993; Sapon-Shevin, 1996). The issues of equity, elitism, democracy, and fear of an intellectual aristocracy are focal points of this side of the debate.

On the other side are those scholars who argue that highly gifted students require a unique and challenging educational program in which their classmates comprise a homogeneous ability group (Gallagher, 1996). These experts believe that most general education classroom settings cannot offer gifted students an appropriate education, since, as Schiver and Maker (1991) suggested, the current organizational structure of general education is geared to the average learner. They maintain that few highly gifted students receive accommodations and that there is great reluctance among teachers and schools to provide them.

Gallagher (1996) pointed out that it would be useful to provide massive
opportunities for both the highly gifted and the others which "encouraged their increased level of performance in whatever area they wish to excel" (p. 246). In this manner, he believed, equity for all is assured.

Unfortunately, however, the notion that students who are highly gifted will learn automatically does persist. Some ideas and strategies needed to learn effectively must be explicitly taught. This is because the highly gifted child has not been previously challenged. He or she still needs basic skills like note taking and effective study skills. He or she is not likely to be discovered by a highly gifted individual. Hallahan and Kauffman (1997) pointed out that, occasionally, a highly gifted student will intuitively perform in an innovative manner; but unless the potential is recognizable and harnessed, the student will not likely to develop the strategies needed for consistent performance. Denying the highly gifted student the right to education that meets special needs is depriving him or her of the equal opportunity to reach maximum potential.

Educators need to realize that this potential has to be properly nurtured and developed. It is vital that a systematic program be carefully developed to steer his or her learning activities toward challenging his or her extraordinary natural endowment. This is attested by Morelock and Feldman (1997) who extrapolated the characteristics of the child who possesses an extraordinarily high IQ. They included (a) extraordinarily high generalized abstract reasoning capability and possibly notable domain-specific skills in one or more areas; (b) intense interest in a number of different areas; (c) problems in committing to a single area of interest, and (d) voracious appetite for knowledge (p.455).

The writer believes that these characteristics must be encouraged and nurtured.
She also believes that such nurturing involves a pressing need for differentiated educational programs and/or strategies. This is particularly true of Malaysian elementary schools.

In summary, the reviewed literature does indicate the need for differentiated curriculum to meet the needs of the highly gifted. Although there is some debate as to the learning environment in which strategies of differentiation are practiced, there is general consensus that these students must be challenged to achieve at their highest potential.

Qualities of Successful Malaysian Differentiated Educational Programs and Strategies

The reviewed literature and the writer’s professional experience provided opportunities to reflect upon what should be the qualities of differentiated programming and educational strategies for Malaysian elementary highly gifted students. In this section these qualities are identified and explained.

The first quality to be delineated is that the curriculum must be qualitatively differentiated. The provision of a qualitatively differentiated curriculum is imperative to accommodate the needs of the highly gifted. Kaplan (1988) stipulated that the differentiated curriculum should be responsive to the needs of the gifted students both as a member of the gifted population and as a member of the general population. Several studies of gifted students also have attested to the need for a sufficiently high challenge level in the curriculum, tasks tailored to interests, and choice over activities (Middleton, Littlefield, & Leher, 1992; Van Tassel-Baska, 1992). Tolan (1985) advocated the need for a challenging curriculum, as the exceptionally gifted mind will go to waste if left
unchallenged. The salient feature or quality addressed in Standards for Programs Involving the Gifted and Talented (The Association for the Gifted, 1989) is the assurance of programs which are commensurate with the targeted students' abilities. The writer feels that this benchmark also is applicable to differentiated programs for the highly gifted.

Piirto (1984) recommended that curriculum and instruction for all gifted students, including the highly gifted, be based on learning characteristics of academically talented children. These characteristics include:

... their ability to learn at a faster rate; their ability to think abstractly about content that is challenging; their ability to think productively, critically, creatively, and analytically; and their ability to increase constantly and rapidly their store of knowledge ... (of) both facts and processes and Procedures. (p. 384)

Piirto also lamented the widespread abuse of grading practices, the "dumbing down" of the curriculum, and the lowered expectations of teachers which have all sapped curriculum of its strength and rigor. She stated that there is a distinct need to increase relevance, discipline, and depth of current curriculum, primarily within the regular education setting where most gifted students are for most of the day.

The second quality of differentiated programming is the implementation of interdisciplinary curriculum. Jacobs (1989) stated: "Interdisciplinary curriculum experiences provide an opportunity for a more relevant, less fragmented, and stimulating experience for students" (p. 10). Piirto (1994) also advocated that curriculum for the gifted should be interdisciplinary. Academically talented students, she argued, should be exposed to the structures, terminologies, and methodologies of various disciplines.
The third quality of differentiated programming is an emphasis on mastery of content knowledge. Highly gifted students have the capacity to learn new and difficult concepts in a shorter time as compared to the less able and, therefore, must be provided with opportunities to absorb the content of different fields at high levels of complexity. (Gallagher & Gallagher, 1983).

The fourth quality of differentiated programming is higher order thinking skills, particularly as related to problem solving. The highly gifted use both divergent and convergent thinking in their approach to problem solving, and they must be able to demonstrate differential thinking characteristics in all oral and written communication (Clark, 1983).

The fifth quality of differentiated programming is the presence of tasks tailored to students' interest/individualized "growth plans". Feldhusen and Moon (1995) advocated the development of an individualized "growth plan" to develop a broad program of services for gifted students. Such a plan possesses three important dimensions. First of all, it is not a requirement for services to be provided. Second, it is more flexible; that is, it has no time for restrictions, reporting requirements, or physical boundaries. Third, it is primarily collaboratively planned but essentially student directed. Such a growth plan should include assessment information, student-generated goals (in consultation with others), and the recommended activities for accomplishing these goals. A key feature of this approach is that the student is guided toward the establishment of his or her own goals and is an active participant in all instructional and evaluative activities. This method is consistent with Maker's (1994) contention that "one of the most important goals of these
(gifted) programs is to increase the individual learner's control of the learning process and opportunities for decision making in situations involving both learning and other aspects of living” (p. 18).

It is well to note, however, that individualized growth need not occur through individual activities. Indeed, as Kitano (1993) states:

... Individualization need not occur through individual activities. Defined as meeting individual learner needs, individualization can occur through group activities. An alternative model that emphasizes curricular rather than structural accommodations enables teachers to extend the regular curriculum by providing a variety of activities to convey major concepts. The activities permit process, product, and differentiation through whole and small group activities. Alternative approaches to individualizing instruction in the regular classroom are needed to accommodate individual teaching styles, philosophies and references. (p. 280)

The sixth quality of differentiated programming is technology and computer-based learning. The highly gifted are very likely to become our society's future technology producers. Thus, present and future education must equip bright students with the skills necessary to generate technological change. Strot (1997) noted: “Technology projects motivate because the student is responsible for choice of topic and is given a creative opportunity in designing products” (p. 13).

The seventh quality of differentiated programming is a planned use of formative evaluation. Such evaluation is imperative both as a check and balance on the implementation of a program and as a gauge of success. Borland (1989) defined
Formative evaluation as follows:

Formative evaluation is the collection of evaluation data on one or more occasions during the school year. The function of formative evaluation is diagnostic. It serves to alert program staff to deficiencies and strengths in a functioning program, and it provides continuous in-process feedback that allows changes to be made in the program while it is in operation. (p. 200)

The immediate feedback will be swiftly dealt with to sustain the program or strategy thus ascertained and implemented. Formative evaluation is done on a continuous basis over a period of time. Remedial and other necessary modifications can be implemented during the course of the program.

United States Models/Strategies for Differentiation

The reviewed literature provided numerous models of differentiated programming and education strategies pertaining to the highly gifted that are currently used in the United States. From her reading and analysis, the writer selected five of these models/strategies which have been successfully implemented in gifted and talented programs across the nation. These included (a) the Autonomous Learner Model, (b) the Integrative Curriculum Model, (c) interdisciplinary curriculum, (d) acceleration, and (e) technology and computer-based differentiated strategies.

The Autonomous Learner Model (ALM) was developed by George Betts (1985) to
meet the cognitive, social, and emotional needs of gifted students. The guiding philosophy of the approach originated in the work of Tannenbaum (1983), who advocated that instruction should go beyond the prescribed role of students as "consumers" of information to that of "producers" of knowledge. ALM was designed to be done in a special class setting by a specially trained teacher, with a great deal of community involvement and support.

The program has five sequential steps that move the students from an initial stage of awareness to the complete (autonomous) control over their learning within two and one-half to three-year period. According to Betts (1985), there are five dimensions of ALM.

Orientation, the first dimension, provides a foundation in aspects of the model and expectations for students, educators, parents, and community members. Betts has stated that students are enabled to learn more about themselves and others. Group roles and functioning are also the focus. Students are made aware of their own unique abilities and further enhance their development for further participation in the model.

Betts defined the second dimension as Individual Development. At this stage, students are given the appropriate skills, concepts, and attitudes for life-long learning as they become autonomous learners. The skills acquired encompasses intellectual skills, discussion skills and career awareness and involvement.

Enrichment Activities, the third dimension, focuses on the development of "student-based content" in contrast to "prescribed content" by teachers and other adults. New content is explored, and students determine what they want to study and how they
want to study the problem(s).

The fourth dimension, Seminars, emphasizes the “production” of ideas and topics. More and more responsibility is placed on the students. They work in small groups and develop a “seminar” in which they present their new ideas and findings. According to Betts, the seminar is implemented in three phases: presentation of factual information, group discussions and/or activities and closure.

Betts defined the fifth dimension as In-Depth Study. Students are given the option either to work individually or in small groups. Long-term opportunities allow students to pursue topics of their choice. Activities include a contract outlining a description of the study, the objectives and activities, questions to be answered, a timeline, a list of human and material resources, and a plan for ongoing and final presentations.

The ALM model has been highly rated as to its effectiveness (George, 1993). The writer herself had the opportunity to observe this model at work as she completed a teaching practicum at Central Middle School, Waterloo, Iowa. The Expanded Learning Program (ELP), based upon ALM, was used at the middle school level. She found the students to be very receptive and enthusiastic in their learning.

Heward (1996) summarized well George Betts’ Autonomous Learner Model when he stated:

The ALM is a combination of in-and-out-of-school model that attempts to provide a saturated learning environment for the gifted students because the model is designed specifically for gifted students. Teachers are able to engage in both highly individualized activities and collaborative group enrichment activities out in
the community. A unique feature of this program is the non-negotiable requirement that students engage in 'service' activities in which they must contribute their time and effort for direct involvement with people who need help. This service includes such activities as volunteering at a hospital or clinic for AIDS patients, providing food and other supplies for homeless or disadvantaged families, and tutoring children with learning problems. (p. 577)

In summary, in autonomous learning students become self-directed, culminating in the realization of self-fulfillment, self-worth and self-acceptance. An autonomous learner also is one who solves problems or develops new ideas through a combination of divergent and convergent thinking and functions with minimal external guidance. The process entails independent study, but interaction with highly gifted peers, is ensured for the total development of the student. According to surveys, students involved in the ALM used in the Summer Enrichment Program at the University of Northern Colorado attested that “initially they were not a cohesive group, or even friends. As time progressed, they acquired an appreciation for each other’s uniqueness, and the feeling of community evolved” (Betts & Hoover, 1995, p. 151).

The ALM appears to incorporate all of the qualities that successful Malaysian differentiated educational programs and strategies should demonstrate. It deals inclusively with the cognitive, emotional, and social needs of highly gifted students, and, as those needs are met, students eventually become self-directed learners. This is one of the major objectives of the Malaysian National Philosophy of Education.
Integrative Curriculum Model

Van Tassel-Baska (1986) advocated the Integrative Curriculum Model for gifted learners and further explicated it in 1993. The writer believes that this model is appropriate and adaptable to programs for the highly gifted. It is comprised of three interrelated dimensions: (a) advanced content knowledge which integrates disciplines of study; (b) higher order thinking and processing; and (c) theoretical modeling within and across areas of study.

The Integrative Curriculum Model also fulfills nine specific criteria (Van Tassel-Baska, 1993). First of all, it emphasizes depth over breadth and concept over facts, grounded in real-world problems that students care about or need to know; it is meaning-based. Second, it incorporates higher order thinking as integral to all content areas. (Examples: Concept mapping, persuasive writing, and designing experiments). Third, it emphasizes intra and interdisciplinary connection through using overarching concepts, issues and themes as major organizers. Fourth, it provides opportunities for metacognition, the student's reflection on the learning process. Fifth, it develops habits of mind through cultivating modes of thinking that resembles those of professionals in various fields with respect to skills, predispositions, and attitudes. Sixth, it promotes active learning and problem solving through putting students in charge of their own learning. Seventh, it is technology-relevant; it uses various new technologies as tools for the learning process, from doing library research via CD-ROM, to composing at the word processor, to communication with students across the world by e-mail. Eighth, it sets learner outcomes of significance. The ninth and final criterion is that it employs authentic
assessment by tapping into what students know as a result of meaningful instruction.

Van Tassel-Baska (1968) suggested that this model is very effective with gifted learners because of their special abilities to see and understand interrelationships. It also helps them to understand creative and intellectual processes through the integration of cognitive and affective curriculum objectives. The writer feels that this model is also applicable to the highly gifted. Subject matter in this epistemological curriculum is reorganized into common themes or units. Class schedules and time tables are synchronized, while the content of several courses are correlated to enable students to make connections among the various subject areas and life experiences. Van Tassel-Baska (1986) stated: “Integrative curriculum can replace the isolated compartmentalized learning experiences that highly gifted children may often receive in accelerated classes and enrichment programs” (p. 49).

Maker (1993) stipulated that the Integrative Curriculum Model must be based on curricular interventions focused on a theoretical conception of the gifted person as a “problem solver - one who enjoys the challenge of complexity and persists until the problem is solved in a satisfactory way” (p. 7). The role of the teacher, she said, is to facilitate and arrange the intellectual, emotional, and physical environment to make it possible for high achievement and creativity to take place.

The Integrative Model also incorporates most of the successful qualities of the Malaysian differentiated educational programs and strategies as enumerated by the writer. However, it must be stressed that formative evaluation should also be given attention in order to ensure the effectiveness of the implementation and to further sustain the model.
Interdisciplinary Curriculum.

Interdisciplinary curriculum is a foundation of the Integrative Curriculum Model. As such, the writer determined that it merited separate analysis and attention as a strategy for meeting the needs of the highly gifted. Jacobs (1989) defined interdisciplinary as: “A knowledge view and curriculum approach that consciously applies methodology and language from more than one discipline to examine a central theme, issue, problem, topic, or experience.” (p. 8).

In contrast to a discipline-field based view of knowledge, interdisciplinary curriculum does not stress delineations but linkages. Meeth (1979) noted that the emphasis is on deliberately identifying the relationship between disciplines. Jacobs (1989) pointed out that the holistic approach is embedded in Western thought which originates from Plato’s ideal of unity as the highest good in all things. She said: “Interdisciplinary curriculum nurtures a different perspective with focus on themes and problems of life experience.” (p. 8)

According to Clark (1983), a well designed interdisciplinary curriculum constitutes among other things, the interdependence of subject matter and the provision of opportunities for students to learn to reconceptualize existing knowledge and to address the unresolved issues and problems of society. She also stated that students are enabled to apply personal and social data to analyze, clarify, and respond to such issues and problems.

Jacobs and Borland (1986) supported the use of comprehensive interdisciplinary studies for gifted children. They argued that it is important to include exploration of
epistemological issues and to focus on development of high level thinking skills in a context of high level content. Clark (1989) concurred that, through interdisciplinary curriculum, highly gifted students can see the interrelationships and interdependence of knowledge structures consistent with current findings on brain research.

In *To Build a House*, Barber, Bergman, and Sneider (1991) presented the philosophy emphasizing the Lawrence Hall of Science GEMS (Great Explorations in Math and Science) thematic approach to teaching science. The house building metaphor is used. The GEMS staff placed thinking processes at the foundation of thematic curriculum. The framework of the curriculum is made up of themes of study. In commenting on this particular approach, Cook and Martinello (1994) stated: “Content knowledge provides building blocks to fill that framework, which are mortared and nailed together by student enjoyment and curiosity” (p. 41).

Themes for interdisciplinary curriculum may be found in professional literature (e.g., Hartoonian & Laughlin, 1989; Rutherford & Ahlgren, 1990; Shoemaker, 1989). According to Cook and Martinello (1994):

The best interdisciplinary theme studies are selected and developed by teachers and students to meet their varied needs in different environments. Teachers can exercise their professional judgement best when they pay attention to particular developmental levels, curriculum standards and goals, student inquiry, and available resources as they select theme studies. (p. 41)

Thus, interdisciplinary curriculum appears to provide the highly gifted with a more relevant, less fragmented, and stimulating experiences. As Van Tassel-Baska, Johnson
and Boyce (1996) stated: “Interdisciplinary curriculum causes students to become thoughtfully involved with important content” (p. 293).

The nature of interdisciplinary curriculum encompasses the qualities thus established for a successful Malaysian differentiated educational program. Mastery of content and the interconnectedness of the various disciplines put things in a better perspective for the highly gifted. However, formative evaluation of the implementation of the model is imperative to make provisions for remedial and/or modifications in ensuring the success of the programs.

**Acceleration.**

Fox (1979) defined acceleration as “A strategy that results in advanced placement or credit may be titled acceleration; strategies that supplement or go beyond standard grade-level work but do not result in advanced placement or credit may be called enrichment” (p. 106).

Van Tassel-Baska (1992) warned that many educators have an incorrect understanding of acceleration. She argued that too often it is viewed as an intervention which aims to speed up children’s educational programs and forces them to graduate from various levels of schooling earlier. She stated:

Acceleration should refer to the rapid rate of a child’s cognitive development, not the educational intervention provided. What we provide in the name of acceleration is appropriate curriculum and services at a level commensurate with the gifted child’s demonstrated readiness and need. (p. 68).
In a sense, academic acceleration is an administrative process that encompasses a wide range of practices. Gallagher (1985) classified seven major methods of acceleration; Davis and Rimm (1988) listed nine; Kitano and Kirby (1986) detailed thirteen. Southern and Jones (1991) have identified fifteen options. In relation to this particular study, the following options can be considered: continuous, self-paced instruction, content or subject acceleration, combined classes, curriculum compacting, telescoping curriculum, extracurricular programs, concurrent enrollment, and early entrance into secondary school.

In the continuous, self-paced instruction, the student is presented with material considered progressively appropriate for current achievement as the student becomes ready. As for self-paced instruction, the student is presented with materials that allows him or her to proceed at a self-selected pace.

Content or subject acceleration is implemented by placing the highly gifted student for a part of a day with students at more advanced grade levels for one or more subjects without being assigned to a higher grade. A child may take math with a class four grades ahead, reading with a class two grades ahead, and physical education with age peers. This type of acceleration considers the varying developmental ages of the two or more grade levels are combined. The arrangement can be used to allow younger children to interact with older ones academically and socially.

Curriculum compacting allows modification/elimination of topics that the highly gifted have mastered or can master in a fraction of the time that their peers need. Reis and Purcell (1993) noted research which showed that mathematics and language arts are areas
where teachers can apply curriculum compacting without any reduction in students’ achievements. This study also found that between 20 and 70 percent of required content topics can be eliminated by using this technique. Reis (1995) found in her study that teachers were able to eliminate 40 to 50 percent of the required content topics without any detrimental effects on the gifted and talented students they taught.

Telescoping curriculum allows the highly gifted to spend less time than normal in a course of study (e.g., completing a 1-year course in 1 semester). Extracurricular programs provide opportunities for the highly gifted to enroll in course work that provides advanced instruction and/or credit for study (e.g., fast-paced language or math courses offered by universities). In concurrent enrollment, the student is taking a course at a higher level. Another form of acceleration is early entrance into secondary school, where the student is admitted with full standing to an advanced level of instruction at least one year early.

Educators researching the effects of acceleration have stressed that, when acceleration is implemented wisely, children show increased interest in school and higher academic achievements. They also receive more recognition of their accomplishments and complete higher levels of education in less time (Kulik & Kulik, 1984; Robinson & Noble, 1991; Southern & Jones, 1991). Pendarvis and Howley (1996) noted that considerable evidence exists that these achievers make great gains when they are accelerated.

Southern and Jones (1991) stated that researchers have described many positive aspects of acceleration by gifted students. These students are able to handle the academic challenges of acceleration. When grouped with students of comparable activities, they
make greater achievement gains, and many of them develop better self-concepts and more positive attitudes about course content and school in general. Pendarvis and Howley (1996) added that acceleration answers the criticism that gifted education segregates these students of the same age; they are still participating in general education programs. Young and Tyre (1992) emphasized that:

Certainly, the opportunity for acceleration should be readily available for those pupils who may benefit from it, but their settlement and progress should be carefully monitored at all times. Schools with a real respect for the individual and quality of person relationships as well as for the achievement have little difficulty in ensuring that pupils who have been accelerated are welcomed into their new forms and will prosper. (p. 136)

The following positive benefits of acceleration have been advanced by advocates (Feldhusen, Proctor & Black, 1986; Clark, 1988, Davis & Rimm, 1988; Southern & Jones, 1992): Increased learning efficiency, increased learning effectiveness, recognition of abilities and accomplishments, increased options for academic exploration, exposure of students to a new peer group, administrative economy, increased time for careers and increased productivity.

Indeed, negative consequences may result if a highly gifted student is not accelerated (Marland, 1972; Stanley, 1979; Southern & Jones, 1991). These consequences include: educational frustration and boredom, lower achievement and productivity, development of apathy toward formal schooling with premature drop out from school, lower academic expectations, reduced learning motivation and poor study
habits, and difficulties adjusting to peers who do not share advanced interests and concerns.

Howley, Howley and Pendarvis (1995) emphasized acceleration which incorporates advanced classes are considered qualitatively differentiated programs for the highly gifted:

The rationale for these provisions reflects the defining characteristics of intellectually gifted children: They learn verbal and mathematical concepts more rapidly than other children. Such children, therefore, should have the chance to encounter academic content at a pace that matches their rate of learning. Because they have achieved mastery of some skills taught in school, gifted students are unable to progress academically without being exposed to content that is more advanced than that presented in the typical classroom for children their age. (p. 85)

Acceleration is one strategy in which the needs of the highly gifted can be fulfilled. Mastery of content knowledge is achieved through compacting and telescoping. An individualized "growth plan" can also be formulated to monitor the progress of the highly gifted in a formative evaluation process.

Technology and computer based educational strategies.

Shore & Cornell (1991) cite the work of Trifiletti (1985) as being the first to advocate specifically the use of micro computers with the gifted, in a variety of uses from programming to applications. He stated: "Gifted children who program computers must teach the computer how to think and solve problems. In doing so, they gain valuable
insight into their own thought and processes" (p. 317).

Computer education is no longer an exotic curricular addendum but an integral part of the standard curriculum, and, according to Van Tassel-Baska, et al (1988), curriculum for gifted students must incorporate these technological advances. The authors also emphasized the need to be sophisticated consumers as well as producers of technology. Accessing advanced knowledge, exploring ideas, conducting research, and even producing new technologies are activities for which they felt the highly gifted must be prepared.

The personal computer has opened pathways to knowledge. Programs such as the Fifth Dimension (Nicopolou & Cole, 1993; Cole, 1995) are enabling primary level school children to experience affiliation, play, education, and peer interaction while being introduced to computers and computer networking.

A rich thinking environment can be created through the use of multimedia, the presentation of information using a combination of techniques including sound, text, and visual through the computer. It provides the highly gifted child with many opportunities to develop a wide range of skills and understanding. Riley and Brown (1998) stated: “The key point is that the real value of multimedia is not necessarily viewing someone else’s effort, but engaging students in researching, designing, and building their own projects” (p. 21). Moreover, the possibility of differentiating content, process, product, and environment via multimedia is a ‘magical experience’ for the highly gifted. Thinking skills are put into practice to obtain maximum potential.

McLeod and Cropley (1989) stated that, pedagogically speaking, the computer
offers, among other things, the possibility of: (a) a high degree of structure in the learning situation; (b) a high level of self-management of learning, for instance through the repetition of difficult sections or the skipping of easy ones; (c) new or increased possibilities for self-evaluation; (d) a great deal of practice for problem solving; and (e) various possibilities for group learning, peer evaluation, and the like.

Thus technology brings information of important problems into the classroom. It communicates complex problematic situations in ways that support and foster review, study, and collaboration necessary to find solutions to real-world problems. In addition, video and interactive computer-based tools encourage in-depth exploration which help students achieve deeper understanding.

The writer wishes to emphasize here that technology and computer-based strategies are not something new in the Malaysian educational setting. Most schools are equipped with at least one computer. The Smart School concept, a computer-based program which will be implemented in pioneer schools across the nation beginning in 1999, offers even more scope for the highly gifted. Their needs will be accommodated by the provision of challenging activities and the IT (information technology) super highway.

Recommendations for Implementation in Malaysian Elementary Schools

This review of literature attempted to identify the feasible differentiated programming and/or educational strategies for highly gifted elementary students in Malaysia. The need for a differentiated programming and educational strategies was extrapolated; qualities for a successful differentiated program were established from the
literature examined as part of the research; and a study of successful curricula and educational strategies pertaining to the education of the gifted in the United States was carried out for feasible implementation in Malaysia.

The writer's analysis of accessible literature on differentiated curricula and/or educational strategies has led her to the conclusion that such differentiation must be at the center of any program designed to meet the needs of the highly gifted elementary children in Malaysia. Indeed, a qualitatively differentiated curriculum is imperative in ensuring that the highly gifted children are challenged to achieve at their highest potential.

The writer also has concluded that differentiated educational programs/strategies seem to call for combinations of strategies and programming, rather than restriction to a single approach. Thus, she recommends a combination or infusion of ALM, the Integrative Curriculum Model, interdisciplinary curriculum, acceleration, and technology and computer-based strategies as the best strategy to implement in order to meet the intellectual, social, and emotional needs of the highly gifted. All of these models/strategies seem to have a common objective: Meeting the needs of the highly gifted in a challenging environment.

In infusing these models/strategies into one program, the writer would recommend that the ALM model can initially start in Year 5, the 'grade skipping' class. While the students are being orientated to the ALM, they also can be taught a variety of content subjects using integrated and interdisciplinary strategies. Acceleration can also take place not only through grade skipping, but also through curriculum compacting and telescoping. In addition, the use of computer technology to access knowledge in greater depth will
provide both breadth and depth of information which are suited to the intellectual levels of the highly gifted. Technology will not only sustain interest, but it will act as a catalyst for the highly gifted to be more innovative and inventive in their pursuit of knowledge and excellence in the academic endeavors provided for them on an individual and a group basis.

Throughout the recommended infusion of these different models and strategies, formative evaluation of the implemented differentiated programs and/or educational strategies is imperative to ensure success, and to rectify any flaws. The findings of such evaluation will serve as gauges to determine the effectiveness of the programs/strategies thus implemented. This periodic evaluation provides reliability and validity to the process.

From her reading and analysis of the literature, the writer would also make the following recommendations in implementing an infused differentiated programming model:

1. Flexibility of scheduling and scheme of work (teaching units) will be crucial in the implementation of the integrative curriculum model and interdisciplinary curriculum. Therefore, educators must not be unilaterally committed to the examination-oriented environment. The writer is convinced that highly gifted children faced with rote learning will go underground and perhaps become underachievers.

2. There should be extensive research to determine the actual extent to which the needs of the highly gifted are being met in the general education classroom. This should be accomplished collaboratively within the particular school districts or zones.

3. Teachers of the highly gifted need to be provided proper training in
disseminating knowledge to and facilitating learning for these highly gifted children. Therefore, more in-service opportunities and/or scholarship grants should be made available.

In conclusion, the successful models practiced in the United States can be safely recommended for implementation either in total or in part in the elementary schools of Malaysia. Highly gifted students hunger for activities and thrive on challenges that befit their high intelligence. Therefore, provision must be made to fulfill their needs and accommodate them by providing a wide variety of learning experiences and learning environments which will cater to their intellectual needs. It appears to the writer that each and every one of the analyzed needs/strategies can be adapted to fit into and to enrich the contextual patterns of Malaysian culture and its education system.
References


Columbus Group (1991). Unpublished transcript of the meeting of the Columbus Group, Columbus, OH.


