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Effective Curriculum and Instructional Models for Talented Students

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This article presents an historical perspective on the evolution of three curriculum and instructional models that have been shown to be effective with gifted learners in various contexts and at various grade levels. It argues for consideration of all three models in a comprehensive program for gifted learners.

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Many people have been attracted to the issue of curriculum for the gifted because they feel it is new territory. While it is true that curriculum has not been a central focus in the field until recently, it would be inappropriate to conclude that we need new models and methods to provide appropriately differentiated learning experiences for gifted learners. The purpose of this paper is to present effective curriculum and instructional models that should form the basis of our curriculum efforts and to discuss their relevance to current school practices.

Over the last twenty years, general principles about appropriate curriculum for gifted children have been delineated. Ward (1961) developed a theory of differential education for the gifted that established specific principles around which an appropriate curriculum for the gifted would be developed. Meeker (1969) used the Guilford Structure of Intellect (SOI) to arrive at student profiles that highlighted areas of strength and weakness so that curriculum planners could build a gifted program to improve weak areas. Curriculum workbooks were structured specifically to address this need in the areas of memory, cognition, convergent thinking, divergent thinking, and evaluation. Renzulli (1977) focused on a differentiated curriculum model that moved the gifted child from enrichment exposure activities through training in thinking and research skills into a project-oriented program that dwelt on real problems to be solved. Gallagher (1975) stressed content modification in the core subject areas of language arts, social studies, mathematics and science. Stanley, Keating, and Fox (1974) concentrated on a content acceleration model to differentiate programs for the gifted. Recent writings, including Feldhusen and Kolloff (1978), Maker (1982), and VanTassel-Baska (1984) have stressed a confluent approach to differentiation of curriculum for the gifted that includes both acceleration and enrichment strategies. Passow (1982) formulated seven cardinal curriculum principles that reflect content, process, product, behavioral, and evaluative considerations.

In examining the state of the art of curriculum and instruction for the gifted, it is clear that there is a multiplicity of approaches that are adopted wholesale for classroom use without adequate testing in a research context and without consideration of their value in the overall educational context. In fact, the recipe approach seems the most popular at the present time. Throw together a special unit on the latest topic of interest in the larger socio-cultural context, add creative problem-solving, mix with higher level thinking skills, and stir in a special research project until done. In order to implement appropriate curriculum for gifted students, there must be concern for the faithful translation of sound models for curriculum and instruction into an action research arena where effectiveness can be continually tested. The curriculum and instructional models presented in this paper have all been tested and found effective with gifted learners. Furthermore, each model emerges from a clearly delineated theoretical and research context.

The three relatively distinct curriculum models that have proven effective with gifted populations at various stages of development and in various domain-specific areas may be termed: 1) the content mastery model; 2) the process/product research model; and 3) the epistemological concept model.

THE CONTENT MODEL

The content model tends to emphasize the importance of learning skills and concepts within a predetermined domain of inquiry. Gifted students are encouraged to move as rapidly through the content area as possible and thus content acceleration in some mode tends to dominate the application of this model in practice. When the diagnostic-prescriptive (D → P) instructional approach is utilized, students are pre-tested and then given appropriate materials to master the subject area segments prescribed.

The D → P instructional approach has proved effective in controlled settings, but has not been widely practiced in regular classrooms for the gifted. Several reasons appear to account for this: 1) like any individualized model, it requires a highly competent classroom manager to implement, for if used appropriately, each student may be working on a different problem, chapter, and even book at the same time. Regardless of the rhetoric surrounding individualization, very little of it is actively practiced in basic curriculum areas; 2) most pull-out gifted programs do not focus on core content areas and therefore avoid the model, even though such teachers are frequently highly skilled in individualized classroom management, and 3) the approach has not been particularly valued by many educators of the gifted because of its insistence on utilizing the same curriculum and merely altering rate. The lecture-discussion approach to the content model is more widely practiced at the secondary level, but its effectiveness is highly dependent on teachers being well versed in the structure as well as the content of their discipline. Too frequently the content model disintegrates into learning the exact same skills and concepts as all learners are expected to do in the school context, only doing more exercises and drill in a shorter period of time.

In the D → P approach, teachers and teaching assistants act as facilitators of instruction rather than as didactic lecturers; although many content-based programs for the gifted place a strong emphasis on lecture and discussion. The curriculum is organized by the intellectual content of the discipline and is highly sequential and cumulative in nature, making a proficiency-based model for achievement outcomes very feasible.

The D → P approach to the content model has been utilized effectively by the talent search programs across the country, particularly in mathematics (Keating, 1976; Benbow and Stanley, 1983). VanTassel-Baska (1984) has shown the effectiveness of the model in teaching Latin. And foreign language teachers have used the model for years to ensure English syntactic mastery in their students. Clearly it represents the most individualized instructional approach to basic curriculum for the gifted that might be undertaken, and embodies a continuous progress philosophy that schools can understand.

The more typical approach to content-based instruction, however, is one that presets the mastery level of expectation for students, frequently requiring more advanced skills and concepts to be mastered one year earlier. The content model employs existing school curriculum and textbooks, so it is not costly to implement. And it attempts to respond to the rate needs of individual students, allowing the very able to move more quickly through the traditional curriculum.

In successful implementations of the model, teachers have made important alterations in the organization of the subject matter being taught. For example, in the fast-paced Latin program, the concepts spread out incrementally over the first three chapters of the book are synthesized into a matrix study sheet, presenting students all five Latin cases, three genders, and two numbers in their various combinations all at once. Homework is assigned only from the third unit where all the interactions of gender, number and case may be practiced. Thus 30 hours of instructional time may be reduced to four or five at the most. And gifted students have mastered the important concepts governing beginning Latin syntax in economical fashion.

Thus what appears as a simple process of moving more quickly through the same basic material takes on a level of sophistication in actual practice. The effective D → P teacher reorganizes the content area under study according to higher level skills and concepts so that the focus of student prescriptive work is in larger increments that carry with them a holistic picture of the topic under study.

The content mastery model for curriculum and instruction also carries with it the capacity to reduce the regular skill-based curriculum for gifted learners in reading as well as mathematics to approximately one-third the time currently expended. This process occurs through two distinct approaches to modifying the curriculum: 1) allowing students to move through the skill development areas at a rate commensurate with their capacity, testing for proficiency and assigning work based on documented increased levels of development, and 2) reorganizing basic skill areas into higher level skill clusters in order to conserve mastery learning time and promote more efficient and challenging learning experiences for talented students.

The first approach might be accomplished through the following modifications:

Reading Curriculum: Topic: Word Attack Skills

Typical Learner Sequence:

Recognizing and Sounding out Consonants	→	Recognizes and Sounding out Vowels	→	Phonemes	→	Prefixes, Suffixes

D → P Gifted Learner Sequence:

Pretest on Reading	→	Analysis of skill gaps inhibiting reading	→	Prescription of work on phonemes, prefixes, and suffixes

The second approach would be accomplished through this additional modification, again in the reading curriculum:

Typical Learner Sequence:

Topic: Word Attack Skills

Subtopics: Recognizing and sounding out consonants, recognizing and sounding out vowels, phonemes, and prefixes and suffixes.

D → P

Gifted Learner Sequence:

Topic: Reading recognition (whole words)

Subtopics: Word attack skills

Prefixes and suffixes

Root words

Through these two modifications then, gifted students can master the typical skill-based curriculum in less time and at an appropriate level of complexity and challenge. For much of the elementary reading, mathematics, and language curriculum, this approach is feasible and efficacious for gifted learners.

The content mastery model, however, does have some limitations and drawbacks. It does not work well in learning tasks where speed and compression are not a relevant consideration. One could hardly imagine reading Shakespeare based on the tenets of content mastery, nor probing a significant world problem. In addition many teachers have interpreted the content mastery model to be merely "covering material" faster and assigning greater amounts of homework, so that many special classes using it deteriorate into a focus on the quantity of consumed material rather than the quality of the learning experience.

THE PROCESS-PRODUCT MODEL

The process/product model places heavy emphasis on learning investigatory skills, both scientific and social that allow students to develop a high quality product. It is a highly collaborative model that involves teacher-practitioner-student as an interactive team in exploring specific topics. Consultation and independent work dominate the instructional pattern, culminating in student understanding of the scientific process as it is reflected in selective exploration of key topics.

Discussed in the literature under the rubric of programs like enrichment triad and the Purdue model (Renzulli, 1977; Feldhusen and Kolloff, 1978), this approach to curriculum for the gifted can be viewed as successful. At the secondary level, special science programs for the gifted have used the model (VanTassel-Baska and Kulieke, 1986). And institutions like Walnut Hills

High School in Cincinnati, Bronx High School of Science, and the North Carolina School of Math and Science have practiced the model as a part of their high-powered science programs for a number of years.

The model seeks to engage the student in problem-finding and problem-solving and to put him in contact with adult practitioners. In the field of science, for example, scientists from Argonne National Laboratory work with academically talented junior high students during the summer to help them develop research proposals for project work during the following academic year. Students actively engage in the generation of a research topic, conduct a literature search, select an experimental design, and lay out their plan of work in a proposal. The proposal is then critiqued by their instructor and the scientist. In this way then, students focus on process skill development in scientific inquiry and strive to develop a high quality product. The following chart delineates the three stages of the inquiry process used in the Northwestern-Argonne program.

Pre-Inquiry (Level 1 skills)

____ 1. The student has acquired scientific knowledge relevant to the question being asked.

____ 2. The student has done a review of related background literature.

Methods of Inquiry (Level 2 skills)

____ 1. The student plans to:
- ____ a. use the techniques of identifying objects and object properties.
- ____ b. use the technique of making controlled observations.
- ____ c. examine changes in various physical systems.
- ____ d. order a series of observations.
- ____ e. classify various physical and biological systems by coding and tabulating data.
- ____ f. use the techniques of ordering, counting, adding, multiplying, dividing, finding averages, and using decimals.
- ____ g. demonstrate the rules of measurement as applicable to specific physical and biological systems (i.e., length, area, volume, weight, temperature, force, or speed).
- ____ h. conduct an experiment by identifying and controlling variables.

____ 2. The student has created operational definitions for the variables under study.

____ 3. The student has stated a testable research hypothesis.

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____ 4. The student plans to manipulate some type of materials.

____ 5. The student has followed the specified proposal format.

Interpretive Inquiry Skills (Level 3 skills)

____ 1. The student transformed the observed results into graphs, tables, diagrams, and reports.

____ 2. The student drew relationships among things he or she had observed.

____ 3. The student generalized from his observations.

____ 4. The student interpreted tabular and graphical data.

____ 5. The student used the skills of interpolation and extrapolation to make predictions based on his data.

____ 6. The student made inferences based on his data.

____ 7. The student related data to statements of hypotheses.

____ 8. The student related previous work to his/her own.

____ 9. The student used the specified project format.

____ 10. The student developed some limitations of his study.

The process-product model for curriculum and instruction of the gifted differs from the content mastery model in that content is viewed as less important and rarely acts as the organizer for this type of curriculum. Student interest is a mainspring for what "curriculum" will be studied. The nature of the evaluation effort is product-based rather than proficiency-oriented, and the focus is on studying selected topics in-depth rather than moving through a given domain of inquiry in a fast-paced manner.

While the model has worked well in some pull-out programs for the gifted and as a part of a total science program at the secondary level, it does present organizational problems for many schools: critics contend that the focus of this model creates confusion around the curricular scope and sequence of learning at any given level of instruction and creates a need for articulating new process and product dimensions into an adopted scope and sequence continuum for the gifted. Furthermore, the model at the elementary level tends to devalue core content elements in the traditional curriculum, and to overvalue independent learning strategies at that stage of development.