# What Makes a Problem Real: Stalking the Illusive Meaning of Qualitative Differences in Gifted Education

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> The whole process of education should thus be conceived as the process of learning to think through the solution of real problems.
>
> (John Dewey, 1938)

Is there a pot of gold at the end of the rainbow? During the course of my involvement in the gifted child movement, I have observed a never-ending quest to define those things uniquely or qualitatively different about the types of curricular experiences which should be recommended for gifted and talented students. Indeed, the term "qualitative differentiation" has emerged as one of the field's major contemporary cliches. More attention has been given to this search for our identity than any other issue in theoretical literature concerning giftedness, with the possible exception of the age-old concern of who are the gifted and talented. Like searches for the fountain of youth and the pot of gold at the end of the rainbow, this quest for the meaning of qualitative differentiation has largely eluded us. This has resulted in a great deal of controversy and confusion about one of the major issues that could very well determine whether our field survives as an entity in special education. As I stated in an earlier article appearing in a previous issue of this journal (Renzulli, 1980), if we are going to survive and prosper as a specialized field of knowledge, we must become as adept at defining those things for which we stand as we have been in dealing with the educational practices we oppose.

My own attempt to deal with the issue of qualitative differences in learning was largely put forth in *The Enrichment Triad Model* (Renzulli, 1977). In the intervening years I have given a considerable amount of thought as to whether or not Triad had the "power" to stand up to the very criticisms described in the early chapters of that book. A good deal of that thought was stimulated by two main influences. First and foremost have been the experiences I have gained as a result of the many Triad-based programs which have developed over the years. It has been my good fortune to have become directly or indirectly involved in many of these programs. Through them I have learned a great deal about "what works," and also what we are capable of delivering in view of our own abilities and resources. These experiences have enabled me to reflect further upon the Triad Model, as well as other models that have been proposed to guide programming for gifted students.

Because I am a pragmatist in the tradition of John Dewey, I believe that theories or models[1] aren't worth a plug nickel unless they can give *specific* and *practical* direction to the day-by-day operations of a program for the gifted. The words specific and practical are emphasized because it is always easy for us ivory tower types to make suggestions to teachers of the gifted that are easily acceptable. However, they are almost impossible to achieve in view of our own abilities, interests, and the amounts of time we can reasonably devote to the task of programming for gifted youngsters. With a flick of my pen, for example, I could easily recommend that teachers of the gifted write an advanced level curriculum on mythology, futuristics, computer programming, or any other esoteric or traditional topic for that matter. In the best tradition of the idealist, I could also go on to suggest that this curriculum be based on the most important concepts and recent knowledge developed in these content areas, and that it should make use of the best learning techniques and latest left brain/right brain jargon. We should, of course, mix in a heavy dose of Bloom's *Taxonomy* for good measure. I might even go so far as to recommend that we involve a few academic scholars in the development of our curricular units, just to make sure that the content is "truly advanced." Now who can argue with this seemingly infallible folk wisdom? My experience with lots of programs and teachers of the gifted allows me to say without hesitation—I can!

There are several reasons why I am not in favor of a gifted program that requires teachers to assume major responsibility for developing a curriculum. One of the main purposes of this article is to put forth an argument that defends this point of view and also deals with some additional concerns about what is or should be the right and proper curriculum for the gifted and talented. My argument will be based on both theoretical and practical concerns, but at this point I would like to mention briefly one issue that might be classified as a political concern. When people from the ivory tower sagely expound wisdom about developing their own curriculum, most experienced teachers of the gifted tend to ignore it completely or say it is a good idea, hoping that someone else will do it! When this advice falls into the hands of administrators or supervisors, however, it may result in unrealistic requirements being placed on teachers who are less than wildly enthusiastic about developing their own curriculum. The by-products of such pressure are usually a large amount of frustration, tension between teachers and their supervisors, a relatively small yield in terms of curriculum actually produced, and an always unsettling feeling about the quality of our efforts.

Lest the reader accuse me at this point of being a complete heretic about curriculum development, allow me to

offer two reservations to the above statements. First, I believe that teachers who have a strong desire to be the authors of curricular materials in self-selected areas of study should be given every encouragement to do so; the teacher-as-author represents one of the highest levels of creative productivity in our profession. Nevertheless, one should only assume this role if she or he is highly motivated to do so. High motivation alone will not, of course, guarantee quality products. However, it is a much better starting point than forcing teachers to develop curricula because someone thought it would be a good idea. Once a person has made a commitment to be an author of curricular materials, he or she must also be willing to approach the task with the same professionalism and concern for quality as an author who is under contract with a commercial publisher. (If this last requirement sounds somewhat harsh, keep in mind that our self-stated goal is to produce high quality, advanced level curricula, reaching "above and beyond" that which is offered in the regular school program.)

A second reservation is that I am not against accelerated, prepackaged, or advanced curricular units. Indeed, I wish that more high quality material was available, especially in the areas of research and methodological skills. At the same time, general education, from diapers through doctorate, has largely emerged as a prepackaged supermarket of curricular units. I don't think that we can solve the problem of qualitative differences in learning by simply adding more "canned" units to the shelves. I will try to elaborate on this argument in more detail in one of the sections that follow.

A second factor that has stimulated additional thought on my part about qualitative differences in learning has been interaction with other theorists and model builders in gifted education. For better or for worse, Triad has been "out there," in print and in action, for others to examine, to criticize, and to raise the kinds of questions that have caused me to rethink my position. There is nothing so powerful in the growth of knowledge as a point-of-view on which others can take aim. When I originally wrote Triad, I stated in the preface that it was my hope to create "a great in-house dialogue" about the meaning of qualitative differentiation. This dialogue has indeed taken place and will undoubtedly continue to take place in the years ahead. I am indebted to my colleagues for this opportunity to debate the issues because I believe that the emergence of quality will only come about when persons are open and honest enough to confront the issues in which we all have a personal interest and professional stake. Through private conversations, occasional public forums, and personal correspondence, I have exchanged thoughts and ideas with many of the leaders in gifted education and these exchanges have helped me to prepare the analysis that is presented in this article.

*John Dewey, won't you please come home.* In many ways, the ideas put forth in *The Enrichment Triad Model* are based on both an interpretation of the educational philosophy of John Dewey and my desire to translate this philosophy into a practical plan for program development. For this reason I am a little embarrassed to begin this section by disagreeing, however slightly, with the quotation by Dewey that appears at the beginning of this article. I would like to believe that all educational experiences should be built around the pursuit of real problems. However, I have long since come to realize that efficiency in the learning process is more easily achieved if we make some use of contrived problems or exercises and if we employ certain methods of teaching that are not necessarily associated with the discovery of a solution to real problems. Simply stated, there is nothing wrong with teaching children the times tables or vocabulary words using methods that may involve memorization, repetition, and other contrived exercises such as using words in a sentence, looking up their meanings in a dictionary, and alphabetizing this week's spelling list. Ultra-liberal educators may disagree with this traditional stance, but the fact remains that these methods have served us well for hundreds of years in providing mass education for the general population.

My concern in this article is not with general education, but rather with qualitative differences in the education of gifted youngsters. In this regard I would like to suggest that one of the major ways we can guarantee such differences is to make real problems the central focus of any plan for gifted education. Before attempting to develop a definition of "real problems" let us examine the rationale for giving these problems such a prominent role in our plan to educate gifted youth.

If there are any two overriding factors that have brought the field of gifted and talented into existence they are:

1. nature has not made every human being a carbon copy of every other, and
2. civilization has continuously produced men and women who have done more than merely learn about or replicate existing knowledge.

If such were not the case, the growth of civilization would be totally dependent upon the *accidental* discovery of new knowledge. Our field does not glorify the copyists or the high level replicators of knowledge and art, and only rarely does history remember people who have made accidental discoveries. Rather, our focus has been on men and women who have purposefully made it their business to attack the *unsolved* problems of mankind. It is for this reason that educators of the gifted constantly invoke such names as Einstein, Edison, Curie, Beethoven, Duncan, and a host of others who have made creative contributions to their chosen fields of endeavor. If mankind's creative producers and solvers of real problems are constantly held up before us as idealized prototypes of the "gifted person," then it seems nothing short of common sense to use their *modus operandi* to construct a model for educating our most promising young people. This is not to say that we should minimize the importance of providing gifted young-

sters with the most advanced courses or experiences involving existing knowledge. Good old fashioned book learning of the accumulated, organized wisdom of the ages helps to provide the stuff out of which new ideas and breakthroughs in knowledge will occur, but a major focus within such courses (or independent from any course) should be on the production of new knowledge. Such production is a function of both mastery of the concepts and principles of a given field, and the creation of a learning environment that purposefully and unequivocally tells youngsters that they can be creative producers. People sometimes seem skeptical when my colleagues and I describe case after case involving outstanding examples of creative and productive work emanating from students participating in Triad-based programs. There is a very simple reason for the quantity and quality of this productivity. From their earliest years in the program, our students are constantly stimulated to explore new and interesting topics and ideas. They are encouraged to develop creative problem-solving techniques and research skills. They understand that they are in this gifted program because we expect them to develop not only the techniques, but also the attitude and task commitment for going beyond existing knowledge. Attitudinal development, a strong belief in one's ability to be a creative producer, is as important as the learning of content. For example, there were probably a thousand people who knew as much about the theory of flight as the Wright Brothers, but Wilbur and Orville made it fly.

Let us now turn our attention to the definition of a real problem. The word "real," like so many other concepts in education, gets tossed around so freely that after a while it becomes little more than another piece of useless jargon. My research on the meaning of a real problem did not produce a neat and trim definition, but I was able to come up with the following list of characteristics which will serve as a set of parameters for analyzing this important concept. Please review the following list with an eye toward determining whether or not you are in agreement with each statement.

## Characteristics of a Real Problem

1. A real problem must have a personal frame of reference, since it involves an emotional or affective commitment as well as an intellectual or cognitive one.
2. A real problem does not have an existing or unique solution.
3. Calling something a problem does not necessarily make it a real problem for a given person or group.
4. The purpose of pursuing a real problem is to bring about some form of change and/or to contribute something new to the sciences, the arts, or the humanities.

To help us clarify the meaning of what makes a problem real, I have selected a few sample activities from a number of gifted programs. Please review each of the following examples and classify them according to the following five types of learning activity:

A. The Pursuit of a Real Problem.
B. The Study of Societal Issues
C. A Simulation Activity
D. A Training Exercise
E. A Puzzle

*Example 1:* Train A left the station at 9:00 a.m. and is traveling south at 50 mph. Train B left the same station at 10:00 a.m. and is traveling south at 75 mph. How long will it take Train B to catch up with Train A?

*Example 2:* High school students discuss and debate several topics in an Advanced Seminar in Social Studies. The topics include Urban Migration, Energy Depletion, Rising Crime Rates, Drug Abuse, and World Food Shortages. They read a wide variety of advanced level background material and prepare position papers on selected topics.

*Example 3:* Please fill in the letters that should appear in the blank spaces. O T T F F S _ _ _

*Example 4:* A primary program for gifted students is organized to resemble a model community. To increase their knowledge of government, the children elect their own officials and learn about various occupations and community helpers by means of roles and responsibilities assigned to them. They design a city flag and compose a song to develop artistic abilities, and learn math by printing their own "money" for use in a play store.

*Example 5:* Sandy, a high school junior, became interested in problems of teenage drinking after hearing a lecture by a cultural anthropologist who spoke at a seminar sponsored by the gifted program. She decided to conduct a comparative study of the differences in attitude between teenagers and adults with regard to various issues raised by drinking and dating practices. She reviewed similar studies in professional journals and obtained books on appropriate research methodology. After designing and field testing a survey instrument and interview schedule, she gathered and analyzed data obtained from a random sample of young people and adults. A research report was prepared and serialized in a local newspaper. Presentations describing her research and recommendations were made to student groups, service clubs, and other adult groups in the community.

A general concensus among various groups of educators has resulted in the following classifications for these examples:

Example 1....D (also could be E)

Example 2....B
Example 3....E
Example 4....C
Example 5....A

Each example is a worthwhile educational activity, and I believe that under the right circumstances, all of them could become stepping stones to one or more types of real problems. As they presently exist, however, only Example 5 has been designated a real problem. In a later section we will return to this example and see if we can use it to develop a list of questions which will help us force out the important characteristics of a qualitatively different learning experience.

*Viva la Difference.* I would like to approach our search for qualitative differences in learning by asking you to join me in a comparison between two models of learning and instruction. Neither model has a name (we will simply refer to them as A and B) and at the beginning of our analysis we will avoid any conclusions about their appropriateness for helping us to define qualitatively different experiences for the gifted.

We will examine the two models in terms of four major variables, these variables being the role of the student, the role of knowledge, the role of creativity (and other processes), and the role of the teacher. This comparison is depicted in Table 1.

Table 1
A Comparison of Two General Models of Learning and Instruction

| Variables | Learning/Instructional Model A | Learning/Instructional Model B |
|---|---|---|
| I. The Role of the Student | | |
| II. The Role of Knowledge (or Content) | | |
| III. The Role of Creativity (and Other Processes) | | |
| IV. The Role of the Teacher | | |

## Model A

Initially, we will make only one assumption about the two models. Let us assume that Learning/Instructional Model A consists of the major principles and practices that have guided the regular curriculum. This assumption is necessary to help us put the problem into proper perspective. Many regular curricular methods and materials are appropriate for gifted students. However, if every variable that we analyze ends up in the same column as the regular curriculum (i.e., Learning/Instructional Model A), then we may be forced to conclude that there really are no basic differences between regular and gifted education. At this point I want to emphasize that I am not belittling or minimizing the importance of any practices that might end up in the Model A column. Indeed, I will begin by placing Types I and II Enrichment from my own Triad Model in that column. I will also take the liberty of placing Type III Enrichment in column B. (In a certain sense, we might entitle this section of our analysis, "In Defense of Type III Enrichment.") We will examine each variable by presenting a chart comparing the two models in accordance with the most important features of each variable.

### *The Role of the Student*

I consider this variable to be the most important part of the argument because I believe the central focus of all educational endeavors should be the student. In the regular curriculum, the student is generally cast in the role of a learner of lessons and a doer of exercise, and in most cases, these lessons follow what I have termed the Four-P Approach (see Table 2). Most lessons are *prescribed* by the teacher or textbook and are *presented* to students without affording them much opportunity to decide whether or not they want to participate. In the majority of cases, the lessons we use in the regular curriculum have *predetermined pathways* to the solution of problems. There is a correct way to derive the formula of a triangle, diagram a sentence, or determine the imports and exports of a Latin American country. Even in areas such as creativity training, we have managed to spell out the five basic steps of creative problem solving. Finally, most prescribed exercises have *predetermined products* as their ultimate goals—that is, students are expected to come up with a correct answer which is usually agreed upon beforehand. Some variation of products is encouraged in creativity training, yet, the first three Ps have been plainly evident in most of the creativity training activities I have observed.

Table 2
The Role of the Student

| Learning/Instructional Model A | Learning/Instructional Model B |
|---|---|
| The Four-P Approach: Prescribed, Presented, Predetermined Pathways, Predetermined Products | Student Selection of Topic(s) Guaranteed |
| Didactic or Instructive in Design | Inductive or Investigative in Design |
| Student's Role is That of Learner of Lessons and Doer of Exercises | Student's Role is That First Hand Inquirer |
| Student is Consumer of Content and Process | Student is Producer of Knowledge and Art |

Model A is also very didactic in nature—it is generally aimed toward instructing students *about* something or teaching them to use a particular process skill that we have prescribed as being good for them. Whenever I think about Model A, I am reminded of a statement made by Mortimer Adler in a speech delivered at the University of Connecticut. He said, "For the gifted person, the person who really wants to learn something, too much instruction is insulting." An unfortunate reality about most of the regular curriculum is that we *instruct* students almost all of the time. We must now raise the same questions about the types of things we typically do in gifted programs. How much time do we spend instructing *these* students? How much of that instruction is Four-P oriented? It is in this regard that we must analyze not only the individual activities we use, but also the models that are proposed to guide the total gifted program. Whenever someone tells me that their program is based on Guilford's (1967) Structure-of-Intellect model or Bloom's (1956) *Taxonomy of Educational Objectives*, the Four-Ps immediately come to mind. These psychological models of human ability were never intended to be program planning models, especially for gifted programs which are trying desperately to break the shackles of too much structure and too many predetermined objectives.

On the Model B side of the ledger, I would like to summarize the major features by referring to Figure 1. This diagram should be "read" beginning with the lightbulb at the center and moving toward the outer rings. We will deal with most of the concepts in Figure 1 under The Role of the Teacher, but it is presented at this time to point out the *central* role students play in selecting topics for individual or small group study. The student's role in Model B is also mainly investigative in nature. Sandy, the student mentioned in Example 5, used investigative methodology to obtain observational evidence about the existence of certain attitudes in her community. In this case, her primary role was transformed from that of lesson learner to one which made her into a first-hand inquirer.

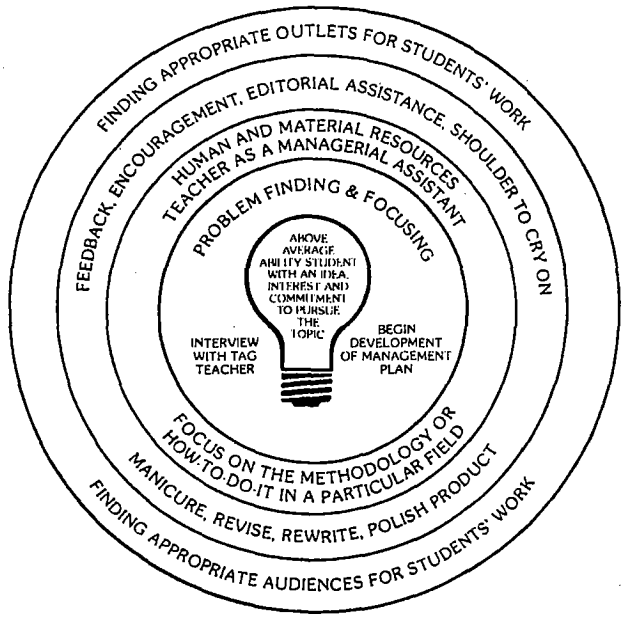


Figure 1. Targeting on Type III.

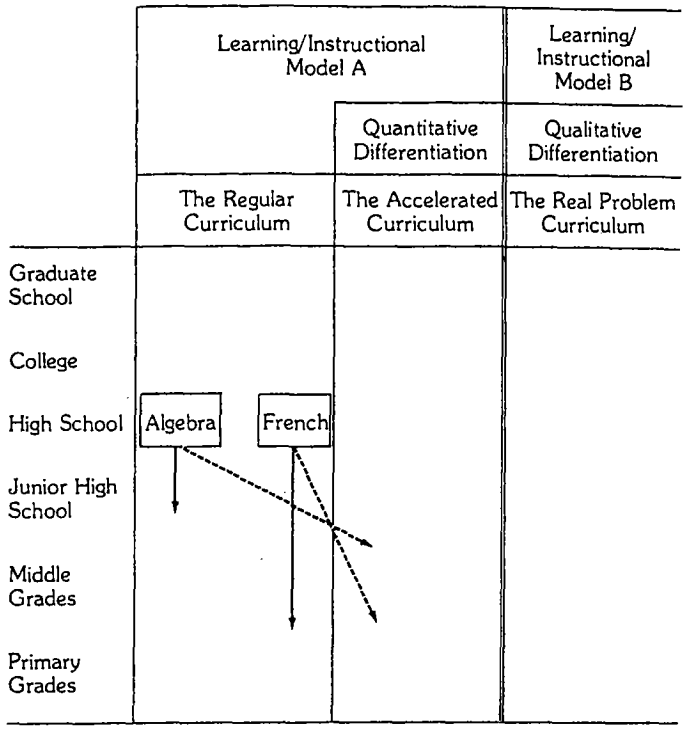


Figure 2. The "course shifting" approach to differentiation: is it quantitative or qualitative?

We cannot leave this discussion about the role of the learner without coming face-to-face with the age-old issue of Acceleration versus Enrichment. I believe that acceleration should be an important part of any program for the gifted. However, a model that relies primarily on the use of accelerated curriculum is undoubtedly based on quantitative rather than qualitative differences in learning. I have attempted to depict these two types of differences in Figure 2, and will clarify them through the use of an example.

When I was in school, subjects as algebra and French were the uncontested province of the high school. When a new spirit of educational reform started to take place, some wise persons suggested that younger people might be able to master these traditionally secondary school subjects. Subsequently, it was not uncommon to find algebra offered to students in the seventh and eighth grades and French

offered to students as early as the third or fourth grade. In the early years of gifted programming in America, one of the first "innovations" was simply affording bright young students an opportunity to take courses that were ordinarily scheduled for later grade levels. The currently popular radical acceleration model recommends that high scorers on mathematics aptitude tests be encouraged to take college level courses in math. Predictably, these high scorers have earned good grades in their advanced math courses and this undisputed fact is certainly justification for making opportunities to make advanced work available to younger students. My concern with this approach, however, is that the learning model and the role of the learner have not changed. To paraphrase Gertrude Stein, "...a course, is a course, is a course." The student is still cast mainly in the role of a lesson learner and the instruction is still mainly of the Four-P variety.

*The Role of Knowledge*

It would probably take nothing short of an entire book to do justice to the role knowledge should play in curriculum for the gifted, but any discussion about this important topic should begin with at least two basic assumptions. First, *knowledge is important!* This statement may sound obvious, if not trivial, but a great deal of the recent rhetoric in gifted education has denigrated knowledge or content in favor of process training and a largely unsubstantiated belief that the gifted person is "process oriented." Knowledge is grist for the mill of the mind and we cannot escalate our processes of mind unless we are feeding this mill with ever-increasing amounts of relevant information. Relevant is the key word here, and the secret of doing this without turning students into encyclopedia-heads will be discussed shortly.

A second assumption is that when we are purposefully attempting to develop qualitatively different materials, materials that go above and beyond the regular curriculum, we ordinarily are not interested in dealing with mundane or trivial knowledge. Our party line talks about *advanced* concepts and *higher* levels of thinking; and therefore, we must avoid focusing our efforts on unimportant knowledge. But who, you might ask, can judge what knowledge is important as opposed to mundane or trivial? That is the key question and the focal point around which we will compare the role of knowledge in Models A and B.

Perhaps the best way to highlight the importance of this question is with an example. I know of one youngster named Paul who spent several months digging out the factual details of everyday weather reports for a time period spanning *fifty* years. The temperatures and amount of snowfall in Hartford, Connecticut, on December 11, 1936 (or any other day), may seem trivial indeed, but it became a very important piece of information in helping to explain why the roof of our multimillion dollar civic center collapsed under a heavy burden of ice and snow. In this case, more detailed knowledge led to more accuracy in the analysis, which in turn resulted in Paul's placing more confidence in the conclusions of his research.

In most prepared materials comprising the regular curriculum, knowledge is treated in a linear and sequential fashion. Even the best textbooks and curriculum guides present students with important facts, major concepts, and underlying principles. After students have ingested the required information, they are usually asked to "do something" with it to demonstrate their comprehension, answer questions, discuss critical issues, prepare a paper or project, etc. They might also be expected to store the information for possible future use.[2] Although I am not necessarily criticizing this almost universal approach to the manner in which knowledge is utilized in the engineered curriculum, I believe we should judiciously avoid recreating the same mode for gifted education.

With the advent of Bloom's *Taxonomy* (1956), persons within the field of the gifted and talented who support the curriculum development approach to differentiation felt they had at last found the magic formula for constructing qualitatively different materials. Lessons and units were prepared that typically began with presented content and "knowledge questions," and proceeded in a step-by-step fashion through analysis, synthesis, and evaluation. In analyzing these materials, there are certain obvious conclusions we must reach. First, they are almost always based on the Four-P approach. Secondly, the important processes listed in Bloom's *Taxonomy* are a part of the right and proper education for all students, not just the gifted. Third, the learning process is still being treated in a linear and sequential fashion. This is my main concern at this juncture in our analysis. There is nothing wrong with the linear and sequential treatment of content and process, but, once again, isn't that the approach that characterizes most of the regular curriculum? Furthermore, when one is pursuing a real problem, neither the content nor the processes can be laid out in a predetermined order. If such were the case, we would undoubtedly be dealing with yet another training exercise.

Let us now turn our attention to how knowledge is used in Model B. When students begin work on problems that hopefully will emerge as bona finde examples of Type III Enrichment, they are steered in their initial contact with knowledge toward exploring the ways in which knowledge is organized within a particular discipline. The investigative methodology is directed toward adding new knowledge to that discipline. In Paul's case, for example, this structure of knowledge (or knowledge about knowledge) approach required him to find out where and how information in meteorology was stored, how he could retrieve it, and the analytic methods necessary for utilizing existing knowledge to create new knowledge. Philosophers and persons who have written extensively about the subject of knowledge (see, for example, Machlup, 1980), refer to this approach as knowledge of..., knowledge about..., and knowledge how.... And, I might add, they always consider

Table 3
The Role of Knowledge

| Learning/Instructional Model A | Learning/Instructional Model B |
|---|---|
| Linear Sequential Processing of Information | Cyclical and Frequently Simultaneous Processing of Information |
| Knowledge is Accumulated and Stored for (Possible) Future Use | Knowledge is Only Sought When Needed for Present Use |
| Students Use Knowledge to Study *About* Problems | Students Use Knowledge to *Act Upon* Problems |
| Teacher/Textbook Predetermines What Information Will Be Used | Needed Information is Determined by the Problem as it Unfolds |

knowledge how—how one adds new knowledge to a field—to be the highest level of involvement within our discipline.

In Triad-based programs, we rely heavily on "how-to-books" for this early experience with knowledge about a field and especially with the "knowledge how" dimension of a field. Once students begin to shape up their problems and focus in a manner that reflects the accumulated wisdom of a field, they usually have a better perspective on the specific types of additional information they need to seek out. This pattern of information gathering and processing repeats itself many times, thus resulting in "back-and-forth" movement among the three major components depicted in Figure 3. Knowledge is thereby dealt with in a cyclical manner, and there is usually a simultaneous, rather than linear, processing of information. The importance or relevance of any given piece of knowledge is determined by the nature of the problem, which, along with the structure of the discipline, steers us toward appropriate input operations, procedures, and sources. I have also found that a frequent by-product of this process is the generation of creative ideas and new topics for investigation.

Returning now to the key questions. What knowledge is relevant? What knowledge is important? What knowledge is of greatest worth? The answer is that *all* knowledge is important, but it is only important to certain persons, at certain times, and in certain situations. Knowledge becomes real to the individual when he or she needs the information. If a real problem does anything for the learning process, it is to set up situations in which certain kinds of knowledge become relevant through necessity. Just as purpose creates real involvement on the parts of individuals, so also does it create a real need for knowledge.

### *The Role of Creativity (and Other Processes)*

Emphasis on the thinking and feeling processes has been an important part of programming for the gifted and talented, and I believe this focus has been a generally favorable part of the overall movement. Since I have dealt with the role of process training in other publications (see especially Renzulli, 1977, pp. 5-1; 1980, pp. 5-6), only a brief rationale will be given here for placing creativity, discovery learning, and other processes in the Model A column. First, process training activities are good for all students. This fact alone prevents them from being offered as the major rationale for qualitative differentiation. Secondly, because these activities are almost always based on the Four-P approach, the role of the student does not change. If we criticized the content-centered curriculum because it was supposedly guilty of "killing kids heads" with names, dates, formulas, and other facts, we must be equally cautious about an approach that simply and repeatedly triple-dips students in one process after another.

Table 4
The Role of Creativity and Discovery Learning

| Learning/Instructional Model A | Learning/Instructional Model B |
|---|---|
| Situational Creativity | Real Creativity |
| Predetermined Discovery | Real Discovery |

My main concern about creativity training is that it is situationally specific, i.e., based on presented situations or problems, and therefore, the responses of students are almost always products which have been "discovered" before. In other words, the products are new or creative for the individual but not new in the sense of coming up with a response that never existed before. Let me quickly add two reservations to the above statement. First, there is nothing wrong with this kind of training—all students should learn the process and how to apply it to problems they encounter in both the presented curriculum and real problems faced in their daily lives. Secondly, if a student

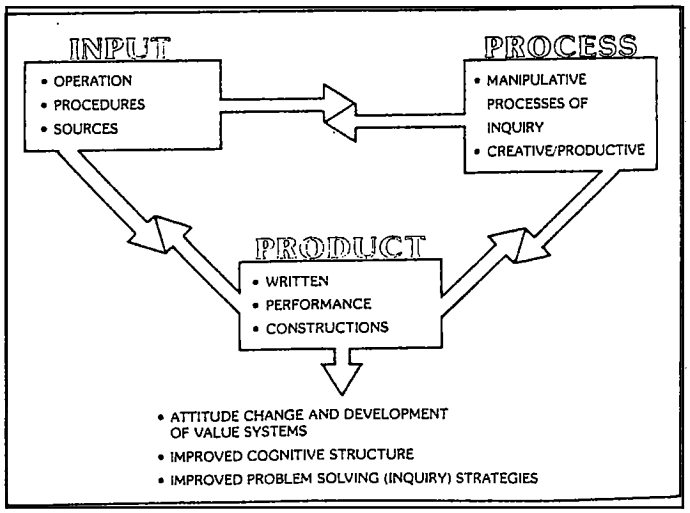


Figure 3. Input/process/product model.

comes up with a truly unique and practical suggestion for solving a problem, and develops a personal commitment to follow through on her or his suggestion, then we have the makings of a real problem situation. It is exactly for this reason that a direct connection is portrayed between Type II Enrichment, i.e., process training, and Type III Enrichment in the Triad Model.

In Learning/Instructional Model B, the focus upon real problems helps us to provide students with opportunities for developing products that are genuinely creative and/or truly unique contributions to knowledge. The study by Sandy is an example. To be certain, other persons have undoubtedly conducted studies using similar variables, instruments, and techniques, but her particular study and data base resulted in research findings about her community that never before existed. Therefore, her product is unique. She also made a "real discovery" rather than the discovery of a fact or principle we predetermined she should discover by neatly laying out tidbits of information which would lead to an existing conclusion. (A colleague of mine refers to the so-called guided discovery method as "sneaky telling.") Guided discovery is a good technique for helping all youngsters better understand existing knowledge, but let us not confuse it with the real thing and the creation of new knowledge.

Before leaving the process issue, I would like to clarify my position on the product/process controversy because I have been characterized as being overly concerned with students' products. I believe that products growing out of real problem situations are indeed important, but only insofar as such products serve as vehicles whereby the processes can be applied in authentic fashion. The processes we focus upon in structured training have no value in and of themselves unless we can put them to work in applied situations, and, as can be seen from the bottom of Figure 6, the ultimate outcome of the total model is not a product but rather three general sets of processes. Even these processes are of no value, however, without opportunities for additional, and hopefully more challenging, application.

### *The Role of the Teacher*

The ways in which teachers' roles vary from Model A to Model B have been touched upon or implied in the foregoing discussion about the first three variables used in this analysis. Table 5 summarizes the main roles played in each model, and I want to emphasize at the outset that I am not minimizing the importance of teacher activities in Model A. In view of the requirements placed upon classroom teachers who work within a system almost totally dominated by the Four-P approach, it is nothing short of amazing that many teachers have been able to transform large parts of the regular curriculum into challenging and exciting endeavors. My concern here, however, is that we don't end up asking teachers of the gifted to play the same role traditionally assigned to classroom teachers.

Table 5
The Role of the Teacher

| Learning/Instructional Model A | Learning/Instructional Model B |
|---|---|
| Administers Curriculum | Methodological Assistant |
| Orchestrates Exercises | Managerial Assistant |
| "Pseudo Expert" in Most Curricular Areas | "Expert" in the Above Two Activities |
| Provides "School House" Evaluation | Helps Student Seek Real Audience Evaluation |

The teacher's major responsibilities in Model B are summarized in the concentric circles surrounding the lightbulb in Figure 1 and have been elaborated upon in greater detail in the section of *Triad* dealing with Type III Enrichment. Our discussion here will focus upon what it means to be an expert in these Model B responsibilities and why this role is important in helping students pursue learning experiences that truly go beyond those ordinarily pursued in the regular curriculum.

Let us begin our discussion of the teacher's role by posing a dilemma with which we are all familiar. Teachers of the gifted cannot possibly be (or become) subject matter experts in the many topic areas in which their students are and should develop high levels of interest and task commitment. This is especially true at the elementary level where teachers are usually expected to provide services encompassing a variety of areas. A popular old educational myth is that "the teacher should learn along with the child," but this questionable ideal is hardly possible when you have several students working on a wide variety of topics. If the teacher's expertise is perhaps limited to a certain subject matter area, or if he or she is unwilling to allow youngsters to venture into certain topic areas lest the teacher's subject matter of competency be quickly outdistanced, there is a danger of imposing the same kind of control on the differentiated curriculum as we have placed on the regular school program.

At the secondary level, teachers generally are more specialized in one or two subject matter areas, but in most cases they are far from being true experts in these subjects. For example, the teacher of history is usually not a historian, the physics teacher is not a physicist, and the music teacher ordinarily is not a composer. Keeping in mind our goal of truly advanced learning opportunities for the gifted, it is easy to see how students, even at the secondary level, can quickly outdistance their teachers in subject matter competency, especially if this competency relates to highly specialized topics within any given course or subject. Nevertheless, this is how it should be, because the alternative is to put reins on students whenever they challenge the upper limit of any teacher's expertise. We cannot pro-

mote the development of our next generation of leaders and creative producers if we are constantly reining in our most able students.

The way out of this dilemma is for teachers of the the gifted to become true experts in certain basic skills that relate to the management of advanced level work. An important part of these managerial techniques is knowing the *concepts* underlying the structure of knowledge and investigative methodoloy discussed in *The Role of Knowledge.* I emphasize the word concepts because it is equally unrealistic for teachers to become proficient in the structure/methodology of several disciplines. They should, however, know that all areas of knowledge are characterized by certain organizational patterns, human and material resources, research methods and techniques, and vehicles for communicating findings with others who share a mutual interest. Another important role is demonstrating a willingness to help students locate resources, to open doors, and knock down barriers as they occur. In Sandy's case, the teacher helped her identify and obtain books on questionnaire design and interview technique, even though these books were located in a college library many miles from Sandy's community. In Paul's case, the weather bureau was at first unwilling to allow him access to the data he needed, necessitating intervention on the part of Paul's teacher to help open the door.

I have known many teachers of the gifted who are indeed real experts in the aforementioned techniques and have the energy to reach out beyond the always limited resources of their own buildings, libraries, and faculties. Their expertise is plainly evident in the accomplishments of their students and in the excitement and commitment these students always display in the pursuit of their individual goals.

## The Q-DEG Quiz

Before we wrap up this analysis of our search for the illusive meaning of qualitative differences in gifted education, I want to reiterate my position on one or two items discussed in connection with Learning/Instructional Model A. I am not "against" prepared curriculum, curriculum development, or the inclusion of accelerated courses in our overall programming efforts for the gifted and talented. Neither am I "against" the Structure-of-Intellect model or Bloom's *Taxonomy.* All of these approaches should be included in a comprehensive plan for meeting the diversified needs of highly able youngsters. My main concern is that we look within these or any other approaches for opportunities to bring about honest changes in the four variables previously analyzed—the roles of students and teachers and the impact of knowledge and process. When we make these kinds of changes, I believe we will also then be taking a giant step forward, toward defining qualitative differences in learning. I have no doubt whatsoever that with appropriate modification some of the factors we have placed in the Model A column could very well end up differing enough from the regular curriculum to be transferred to Model B.

At the beginning of this article an argument was introduced that equated real problems with qualitative differences in learning. I would like to close by proposing a series of questions I call the Qualitative Differential Education for the Gifted (Q-DEG) Quiz. The questions were designed to be somewhat of an "acid test" for qualitative differences in learning and can be raised in connection with any particular piece of work a youngster does in a special program. If you agree that Sandy's study of teenage drinking and dating is representative of a real problem, you might want to keep her in mind as you review the questions.

## The Q-DEG Quiz

| | YES | NO |
|---|---|---|
| 1. Did every student do it? | — | — |
| 2. Should every student do it? | — | — |
| 3. Would every student want to do it? | — | — |
| 4. Could every student do it? | — | — |
| 5. Did the student do it willingly and with zest? | — | — |
| 6. Did the student use appropriate resources and methodology? | — | — |
| 7. Was the work directed toward having an impact upon an audience? | — | — |

In Sandy's case, the answers to the first four questions are NO; the remaining three are YES. These answers represent for me the characteristics of a qualitatively different learning experience and the makings of a real problem.

The teacher must keep alive
That spark of wonder
To prevent it from becoming
Blase from over-excitement,
Wooden from routine,
Fossilized through dogmatic
Instruction, or dissipated
Through random exercise
Upon trivial things.

(John Dewey, 1938)

## Footnotes

1. I must admit that I have not been able to differentiate in my own mind the differences between a theory and a model and will therefore take the liberty of using the terms interchangeably. I will also use the term, gifted education, to avoid the more cumbersome but proper education of the gifted.
2. I'm certain everyone reading this article remembers, for example, the Eleventh Amendment to the Constitution and the Articles of Confederation!

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## THE 1983 HOLLINGWORTH AWARD COMPETITION

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