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Guiding the Gifted in the Pursuit of Real Problems: The Transformed Role of the Teacher

Joseph S. Renzulli

In the Enrichment Triad Model (Renzulli, 1977), I defined Type III Enrichment as "individual and small group investigations of real problems." A rationale was developed that attempted to support Type III as the highest level of experience that can be offered in special programs for the gifted. A subsequent article (Renzulli, 1982) further developed a "defense" for the great emphasis programs for the gifted should place on Type III Enrichment and the important role real problems play in creating vehicles for truly qualitative learning differences. Following a brief review of the characteristics of a real problem and a discussion of the differences between traditional and real problem learning situations, this article will attempt to describe the role teachers should play in guiding students in Type III Enrichment.

What Makes a Problem Real?

Any discussion about educational activities that hope to make use of "real problems" must begin with at least some concern for the meaning of this often-used but still largely illusive concept. Although formal definitions are virtually nonexistent, there is some agreement regarding the characteristics or conditions associated with real problems. These characteristics are as follows:

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.

The meaning of a real problem might be more easily understood if we contrast those characteristics with conditions generally associated with more formal kinds of learning situations. In the traditional or engineered curriculum, the student is almost always cast in the role of a learner of lessons. In most cases, these lessons follow what I have termed elsewhere as the Four-P Approach to learning (Renzulli, 1982). The lessons are *prescribed* by the teacher or textbook; they are *presented* to students without much opportunity for freedom of choice about one's participation. The lessons usually have *predetermined pathways* to the solution of problems, and the end result of any given segment of instruction is usually a *predetermined product* in the form of a

correct answer. Four-P learning situations are generally structured and didactic in design, and the teacher's role is ordinarily one of disseminating knowledge and developing various types of thinking processes. This teacher-as-instructor role results in a corresponding student-as-consumer role. By and large that is how most of the educational game is played. However, there are alternatives to this almost universal approach to schooling. One alternative is based on learning situations that take place through the pursuit of real problems. The major feature of these situations is that the learner's role is transformed, and this transformation requires corresponding changes in the duties performed by teachers.

Real Problem Situations and the Role of the Teacher

Although we may not be able to formally define the meaning of real problems, a comparison between the Four-P Approach and the characteristics of real problems listed above clearly indicates the presence of two decidedly different approaches to learning. In real problem situations students assume roles as first-hand inquirers and producers of knowledge. They may pursue these roles at less complex levels than adult researchers, artists, and other creative producers; but the main point is that they go about their work thinking, feeling, and doing like the practicing professional. The end product of their efforts is not merely learning about existing knowledge. Rather, the major purpose is to *use* existing knowledge and methodology to create something that is new. This type of learning situation is purposefully modeled after the *modus operandi* used by creatively productive individuals. Let me hasten to add that there is nothing wrong with learning about existing knowledge, and gifted students should be given every opportunity to do so at their highest attainable levels. In other words, advanced lesson learning should be the "regular curriculum" for our most able students. But, we must also keep in mind that persons recognized as the truly creative and gifted individuals of the world have always been individuals who have gone beyond existing knowledge to create new ideas and knowledge of their own. If we want our gifted programs to be more than simply hot-houses for advanced lesson learning, then we must guarantee opportunities for *authentic* experiences in the creative/productive process. We must model our programs after the kinds of people we want our programs to produce!

Real problem situations quite obviously call for a far different set of responsibilities for teachers than those ordinarily used in their instructive roles. These responsibilities are summarized in Figure 1 and will be described in the sections that follow. The action depicted in Figure 1 begins with the lightbulb at the center of the drawing and moves toward the outer rings of the diagram.

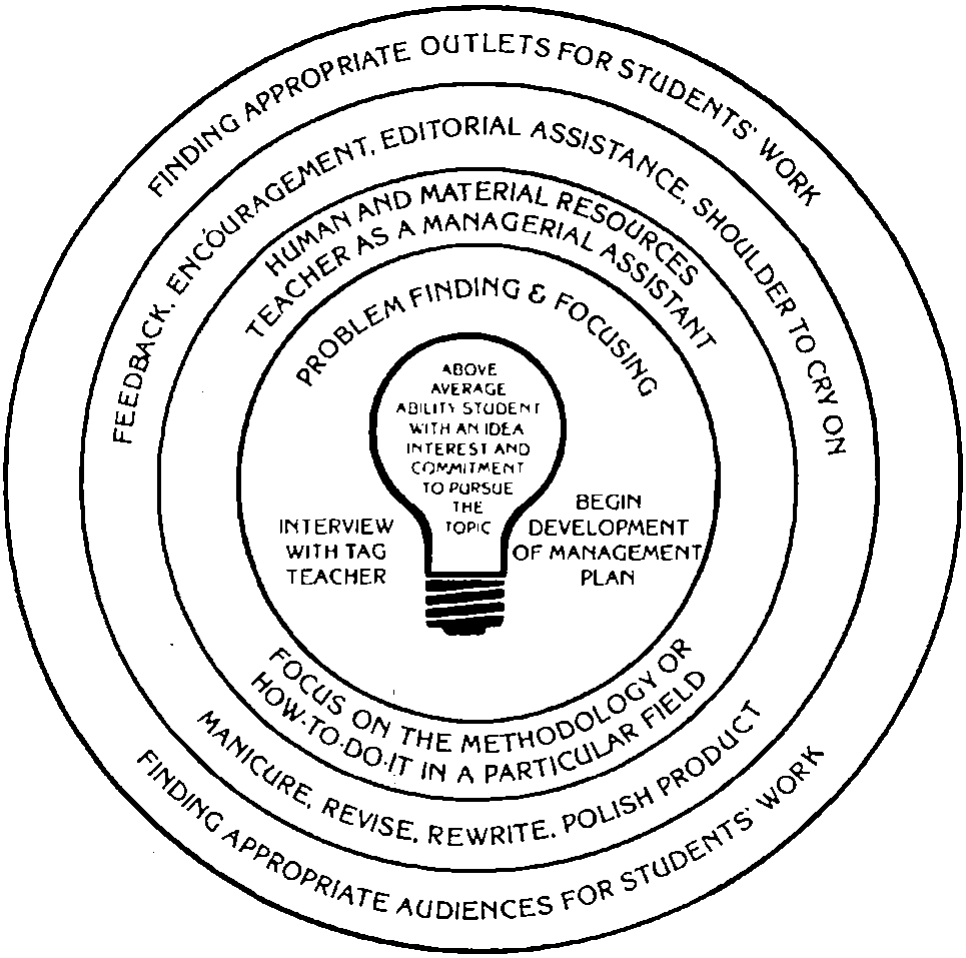

Figure 1. Targeting on Type III.

Problem-Finding and Focusing

Although considerable attention has been given to the study of problem solving, educational psychologists have only recently begun to examine some of the issues related to the equally important process of problem-finding (see for example, Getzels, 1975). Unfortunately, most elementary and high school students learn to view "problems" as questions with known solutions that are posed by teachers or textbooks. This orientation results in learning habits consisting mainly of "looking up" information and reporting already existing facts and conclusions. Even when students are given an opportunity to select their own problems or topics for individual study, previous habits frequently result in little more investigative activity than raising questions about interesting facts or mysterious phenomena and tracking down the answers in reference books. Students and teachers sometimes describe this activity as "doing research," however, the process is clearly one of reporting rather than researching.

The process of problem-finding and focusing should begin by first determining the students' general areas of interest. These interests might be identified through formal or informal assessment techniques or they might actually be created through

purposefully conducted interest development activities. Most teachers have little difficulty recognizing general families of interests—scientific, historical, literary, mathematical, musical, athletic. However, problems arise when they attempt to capitalize upon these general interests and use them as the starting point for (1) focusing on a specific manifestation of general interests and (2) structuring specific interests into real problems. How teachers deal with interests, both general and specific, is crucial, and if handled improperly will undoubtedly get students started on the *wrong* track.

I know of one youngster, for example, who expressed an unusually high interest in sharks. The teacher appreciated the child's enthusiasm, and reacted in what he thought was an appropriate fashion: "I'm glad you have such a great interest in sharks—why don't you *do a report a*bout sharks?" Those awful words, "do a report about..." lead to an inevitable end result—yet another summary of facts and drawings based entirely on information copied from encyclopedias and "all-about" books. While the student prepared a very neat, accurate report, her major investigative activity was looking up and summarizing already-existing information. She did not provide new information or conclusions to the available knowledge of sharks. If we review the characteristics of a real problem listed above, it is clear that this type of traditional report writing is far different from the kinds of research carried out by mature investigators.

Some training in reporting is a necessary part of a good education for all students, because the pursuit of new knowledge should always begin with a review of what is already known about a given topic. The end result, however, should be a creative contribution going beyond existing knowledge.

How can teachers get students started toward more creative and productive type of involvement? The first step is to help students ask the kinds of questions routinely raised by persons who do investigative research *within* particular fields of knowledge. At this point, however, we are faced with a practical problem. Because most teachers are not themselves well-versed in asking the right questions about specific fields of study, we must assist students in obtaining the methodological books (or resource persons: if available) that routinely list these important questions. In other words, if we want to ask the right questions in anthropology, then we must begin by looking at techniques used by anthropologists. Every field of organized knowledge can be defined, in part, by its methodology. In every case, this methodology can be found in certain kinds of guidebooks or manuals. Unfortunately, much of this material is not ordinarily included in elementary or high school libraries, but the fact that it is not easily available does not mean that highly able students cannot make appropriate use of at least selected parts of advance materials.

A few years ago I worked with a small group of high ability sixth graders who had a strong interest in history. I obtained a book entitled *Understanding History: A Primer of Historical Method* (Gottschalk, 1969) for them from a college library. This book contains a wealth of practical information about how to actually *be* an historian rather than merely learning more about the accumulated facts of history. One section of the book neatly

lists the kinds of questions that an historian raises in the process of problem-finding and focusing. These questions are as follows:

> The beginner, with or without aid, can easily discover a subject that interests him and that will be worthy of investigation—at least at an introductory level. He needs only to ask himself four sets of questions:
>
> 1) The first set of questions is geographical. They center around the interrogative: “Where?” What area of the world do I wish to investigate? The Far East? Brazil? My country? My city? My neighborhood?
> 2) The second set of questions is biographical. They center around the interrogative: “Who?” What persons am I interested in? The Chinese? The Greeks? My ancestors? My neighbors? A famous individual?
> 3) The third set of questions is chronological. They center around the interrogative: “When?” What period of the past do I wish to study? From the beginning till now? The fifth century B.C.? The Middle Ages? The 1780’s? Last year?
> 4) The fourth set of questions is functional or occupational. They center around the interrogative: “What?” What spheres of human interest concern me most? What kinds of human activity? Economics? Literature? Athletics? Sex? Politics? (Gottschalk, t 969).

Several brainstorming and individual discussion sessions were conducted using these questions as guides. Within a short time almost every student converted his or her general interest in history into a specific topic or problem. The students were fascinated by the almost limitless number of opportunities for original historical investigations that could be conducted right in their own community and the vast array primary source documents available locally.

The problem focusing activities resulted in the selection of topics much more manageable in scope and size than those usually chosen by students who approach history in a less authentic fashion. Early in their work they also gave some preliminary attention to the formats their final products might take and some possible outlets and audiences for their work. These concerns will be discussed in the final section of this article, but are mentioned here because some consideration about product format and audience will influence both problem focusing and the investigative activities that follow. For example, a dramatization of the execution of Nathan Hale for a primary grade audience requires a different level of involvement than the preparation of an article on the same topic for a state historical society journal.

Focusing on Methodology

The second major responsibility of teachers in real problem learning situations is to give students methodological and managerial assistance. Methodological assistance means helping students to acquire and make appropriate use of the specific data-gathering tools and investigative techniques that are the standard and necessary methods for authentic research in particular fields of study. If a problem is well defined and focused,

the correct guidance by teachers during this phase of a study can almost guarantee that students will be first-hand investigators rather than reporters. This step of the process involves shifting our emphasis from learning *about* topics to learning *how* one gathers, categorizes, analyzes, and evaluates information in particular fields.

Every field of knowledge is characterized, in part, by certain kinds of raw data. New contributions are made in this and across fields when investigators apply well-defined methods to the process of "making sense" out of previously random bits and pieces of information. Although some investigations require levels of sophistication and equipment far beyond the reach of younger students, almost every field of knowledge has entry level and junior level data gathering opportunities

I have seen scientifically respectable questionnaire studies on food and television preferences carried out by primary grade students. A group of middle grade students is currently gathering and analyzing water samples as part of a Northeast area study on the extent and effects of acid rain. This work has been so thoroughly and carefully done that their findings have been requested for use by the state Environmental Protection Agency. Another group of elementary students uses very professional techniques in every aspect of producing a weekly television show broadcast by a local cable company. A fifth grade student has written a guidebook that was adopted by the mayor's office as the official historical walking tour of his city and a group of high school students engaged in a very sophisticated community research and citizens' action project that resulted in the appropriation of $200,000 for a citywide system of bikeways. The success and high level of product development reflected in each example can be traced to the proper use of authentic methods and techniques, even if these techniques were carried out at a somewhat junior level.

At this stage of real problem situations the teacher's role is to help students identify, locate, and obtain resource materials and/or persons to train students in the appropriate use of investigative techniques. In some cases we may have to consult with librarians or professionals within given fields for advice about where and how to find resource materials. We may also need professional assistance in translating complex concepts into levels students can understand. Although methodological assistance is a major part of the teacher's responsibility, it is not necessary or realistic to expect teachers to have mastered a large number of investigative techniques. A good general background and orientation toward the overall nature of research is necessary, but the most important skill is the ability to know where and how to help a student obtain the right kind of material and the willingness to reach out beyond the usual school resources for specialized kinds of materials and resource persons.

Managerial assistance consists of helping students to "make arrangements" for obtaining the types of data and resources necessary for their investigations. Setting up an interview with a public official, arranging for the distribution of a questionnaire to students or parents, and providing transportation to a place where data will be gathered are all examples of managerial functions fulfilled by teachers in real problem situations. Additional activities might include gaining access to laboratories or computer centers,

arranging for the use of a college library, helping students get access to a telephone or photocopying machine, and driving downtown to pick up some photographic materials or electronic parts. The teacher's responsibilities in this regard are similar to the combined roles of research assistant, advocate, ombudsman, campaign strategist, and enthusiastic friend. At this stage of product development the student should be the leader and emerging expert, while the teacher assumes a supportive rather than authoritative posture. The teacher's typical comments should be: What can I do to help you? Are you having any problems? Would you like to bounce a few ideas off of me? The major purpose of the managerial role is to help the student stay on track and moving toward each intermediate goal and accomplishment. A planned strategy for bringing the teacher up to date on progress between meetings will create a vehicle for fulfilling the managerial role. A log, notebook or annotated time line are good examples of such vehicles.

The Editorial and Feedback Process

Even the most experienced researchers, writers, and creative producers need feedback from persons who can reflect objectively upon a given piece of work. For young scholars who are having initial experiences in the often frustrating tasks of first-hand inquiry, this feedback must be given in a firm but sensitive manner. The major theme or idea underlying the feedback process is that almost everything can be improved upon in varying degrees through revisions, rewriting, and attention to details, both large and small. This message must be conveyed to students without harsh criticism or discouraging comments. Each student must be made to feel that the teacher's most important concern is to help the aspiring artist or scholar reach the highest possible level of excellence. Just as a champion athlete or dancer knows that a rigorous coach has the performer's best interests at heart, so also must students learn that critical feedback is a major service that good teachers must offer.

There are several ways students can learn about the relationship between high quality and the feedback process. Books such as Gottschalk's describe the functions of succeeding drafts of historical manuscripts. The text provides examples of first draft and edited copies of the same manuscript. A similar strategy is to locate well-written journal articles in the student's area of research and other products that profoundly illustrate how a particular method was described or results were reported. Outstanding examples of work completed by other students of the same age will also provide prototypes as well as motivation to pursue revisions that might be necessary.

The teacher should view his or her role in the feedback process as that of a "resident escalator." Sensitive and specific recommendations about how particular aspects of the work can be improved will help the aspiring scholar to move slowly but surely toward higher and higher levels of product excellence. Every effort should be made to pinpoint the areas where suggested changes should be made. This approach will help avoid student discouragement and reconfirm a belief in the overall value of their endeavors.

Finding Outlets and Audiences for Student Products

If the use of real problem situations is to have maximum value in the overall development of young scholars, major attention must be given to helping them find appropriate outlets and audiences for their most creative efforts. This concern is once again modeled after the *modus operandi* of creative and productive individuals. If we could sum up in as few words as possible the *raison d'etre* of highly creative artists and scholars it would certainly be *impact upon audience*. Creativity is a source of personal satisfaction and self-expression, but a good deal of the rewards come from bringing about changes in the human condition. The writer hopes to influence thoughts and emotions, the scientist carries out research to find better ways of contributing to the knowledge of his or her field, and artists create products to enrich the lives of those who view their works. Teachers can help young people acquire this orientation by encouraging them to develop a sense of audience from the earliest stages of a creative endeavor.

The teacher's role regarding outlets and audiences requires helping students take one small but often neglected step in the overall process of product development. The first step is to consider how people typically communicate results or products within given fields of the arts and sciences. Once again we can look to the activities of practicing professionals for guidance. In most cases young artists and scholars will be restricted to local outlets and audiences, but there will be occasions when products of unusual excellence can be shared with larger audiences. Some examples of outlets and audiences that have been used regularly in programs organized around the Triad Model follow:

- Presentations at local historical societies.
- Reviews of children's books in the book review sections of local and state newspapers.
- Presentations before civic clubs, businessmen's organizations, and church groups.
- Books published by the school and included in all libraries throughout the school district.
- Art and science product displays in public buildings, banks, shopping centers, and schools, both local and far away.
- Contributions of written products and audio tapes to local and state historical societies.
- Local radio and television presentations.
- Student-produced films, video tapes, filmstrips, literary, and scientific magazines.

In addition to locating local audiences, teachers should help students gain a perspective for more comprehensive outlet vehicles. All professional and hobby groups publish state and national newsletters and journals. Lists of publishing companies and magazines specializing in or receptive to contributions by young people are available. Just as gifted athletes extend their involvement into larger and larger fields of

competition, so also should our most able young scholars and artists be encouraged to reach out beyond the local levels of success they have achieved. This process involves an element of risk-taking and the chances of not having one's work accepted in the wider arenas of competition. But at the same time, we have built in an element of success by beginning at the local level and are providing a "real world" experience to help young people learn about the rigors and challenges of the creative producer.

There is one overriding goal to the development of learning opportunities based on the pursuit of real problems. This goal is larger than the products that students prepare or the methods they learn in the pursuing of their self-selected problems. The largest goal is that students begin to think, feel, and do like creative producers. Our most potentially able young artists and scholars must develop the attitude that has reinforced the essence of creative people since the beginning of time—I can do…I can be…I can create.

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Joseph S. Renzulli, Department of Educational Psychology.
Address: The University of Connecticut, Storrs, Connecticut 06269.