

Innovative Approaches for Developing Giftedness Using Enrichment Clusters

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*Information is cheap and ubiquitous.
Knowledge isn't power or consultants
would rule the world. Action and
implementation are power.*
Edith Weiner

As conceptions of giftedness have expanded to consider a broader range of human potentials (Gardner, 1993; Renzulli, 1978; Sternberg, 1984), so also has the range of service delivery options expanded to include greater access to services for young people who show their potentials in different ways. For the past several years we have been experimenting with an innovative new concept called enrichment clusters, and this article will describe the rationale underlying this concept and the guidelines for organizing and conducting an enrichment cluster program. The theoretical rationale underlying enrichment clusters is the Enrichment Triad Model (Renzulli, 1977); and the essence of this model is to provide a broad range of general enrichment opportunities to larger groups of students within pre-selected interest areas (Types I and II Enrichment) followed by more intensive individual and small group follow up on the parts of individuals with highly focused interests in particular areas.

To understand the essence of enrichment clusters is to compare how learning takes place in a traditional classroom with how someone might learn new material or skills in real-world situations. The majority of classrooms are characterized by an organizational pattern largely driven by the need to acquire and assimilate predetermined information and skills imposed from *outside* the classroom (i.e., textbooks, curriculum guides, state standards). Contrast this type of learning with the more natural chain of events that takes place in research laboratories, business offices, service organizations, publishers' organizations, theater guilds, or film studios. In these situations, the goal is to produce creative products, services, or solutions to real problems. All resources, information, schedules, and events are directed toward this goal, and looking up new information, conducting experiments, analyzing results, or preparing a report are activities focused primarily on the *present need* for information rather than information that is needed to pass a test or to prepare for a distant future. It is these present uses of content and processes that have the greatest amount of transfer value for future use. When content and processes are learned in authentic, contextual situations, they result in more meaningful uses of information and problem-solving strategies than the learning that takes place in overly structured, prescribed

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classroom situations. In short, enrichment clusters are specifically designed for learning by action and application to real-world problems through the use of what we call high-end learning.

High-End Learning Defined

High-end learning is based on the ideas of a small number of philosophers, theorists, and researchers (e.g., John Dewey, Albert Bandura, Howard Gardner, Maria Montessori, Philip Phenix, Robert Sternberg, E. Paul Torrance, Alfred North Whitehead). The work of these theorists, coupled with our own research and program development activities, has given rise to the concept that we call “high-end learning.” The best way to define this concept is in terms of the following four principles:

1. Each learner is unique, and, therefore, all learning experiences must be examined in ways that take into account the abilities, interests, and learning styles of the individual.
2. Learning is more effective when students enjoy what they are doing. Consequently, learning experiences should be constructed and assessed with as much concern for enjoyment as for other goals.
3. Learning is more meaningful and enjoyable when content (i.e., knowledge) and process (i.e., thinking skills, methods of inquiry) are learned within the context of a real and present problem. Therefore, attention should be given to opportunities to personalize student choice in problem selection, the relevance of the problem for individuals and groups who share a common interest in the problem, and strategies for assisting students in personalizing problems they might choose to study.
4. Some formal instruction may be used in high-end learning, but a major goal of this approach is to enhance knowledge and thinking skill acquisition gained through *teacher instruction* with applications of knowledge and skills that result from *student construction* of meaningfulness.

Many educators have asked us to be more precise about the goals of enrichment clusters. They want answers to questions such as “What are the specific skills that define high-end learning and how are these skills different from the traditional goals of didactic learning?” To address these questions, we used an inductive rather than deductive approach—that is, rather than making a list from the theoretical literature or our own expectations about goals and outcomes, we examined activities taking place in clusters, evaluated student work and teacher involvement, and drew conclusions based on these actual experiences. In other words, we did exactly what we are recommending students do as they go about pursuing problems in their enrichment clusters.

After carefully examining the work of numerous students and questioning many teachers who participated in the enrichment cluster research project, we were able to identify the following list of specific outcomes. Not all outcomes occurred in every cluster, and the levels to which any individual or group achieved these outcomes varied. Taken collectively, however, we believe that these learning behaviors represent a fairly comprehensive list of outcome goals. We recommend that you include such a list in a proposal for or description of an enrichment cluster program. The specific skills that are the goals of high-end learning include developing the ability to

- find and focus a problem that has personal relevance to the individual or group;
- distinguish between problem-specific, relevant and irrelevant information, identify bias in information sources, and transform factual information into usable knowledge that will help solve the problem;
- plan tasks that address the problem, sequence events in their most logical and practical order for attacking the problem, and consider alternative courses of action and their possible consequences;
- monitor one's understanding at each level of involvement and assess the need for gathering more advanced level information (content), methodological skills (process), and human or material resources;
- notice patterns, relationships, and discrepancies in the information gathered and use this information to refine tasks for addressing the problem and drawing comparisons and analogies to other problems;
- generate reasonable arguments and explanations for each decision and course of action;
- predict outcomes; apportion time, money, and resources; value the contributions of others to the collective effort; and work cooperatively for the common good of the group;
- examine ways in which problem-solving strategies from one situation can be adopted in or adapted to other problem-solving situations (transfer of learning);
- communicate in lively and professional ways to different audiences and in different genres and formats.

The ultimate goal of learning that is guided by the four principles and the specific goals or outcomes listed above is to replace dependence and passive learning with independence and engaged or active learning. Although all but the most conservative educators will agree with these principles and outcomes, much controversy exists about how these (or similar) principles and outcomes may be applied in everyday school situations. Some might view these principles as yet another idealized list of generalities that cannot be easily manifested in schools already overwhelmed by prescribed curriculum and deductive models of teaching. For this reason, we have provided guidelines for developing schedules that inserts enrichment clusters into the regular school week without forcing out other activities. By setting aside a time and following a simple set of guidelines, all students will have opportunities to participate in high-end learning experiences sometime during their school week.

The most difficult part of facilitating high-end learning is getting teachers to stop prescribing and to replace traditional instruction with the kinds of “guide-on-the-side” responsibilities that are used by mentors, coaches, agents, talent scouts, and persons who are promoters of creative productivity. People in these roles instruct only when there is a direct need to accomplish a task necessary for developing a product or service. Many teachers who have served in extracurricular activities such as yearbook advisors, drama club directors, 4-H Club advisors, or athletic coaches already have the techniques necessary for high-end learning. The basic characteristics of enrichment cluster activities follow:

- Students and teachers select the area in which they participate.
- They produce products and/or services that are intended to have an impact on a particular audience.

- They use the authentic methods and advanced level content of professionals to produce their product or service. They may operate at a more junior level than adult professionals, but their goal is exactly the same—to produce a product or service of as high quality as possible within their level of experience and the availability of resources.

The teacher's role in these activities is to guide students as they find and focus a real-world problem, lend a hand as they locate content and methodological resources, and help them understand how to use the resources. For example, in a cluster that examined the incidence of acid rain in the northeastern part of the United States, the teacher taught students how to prepare slides for microscope analysis and, with the aid of a microprojector, showed them how to identify contaminants in their rainwater samples. Direct instruction should take place *only* when the acquisition of a new skill needs some explanation and demonstration by the teacher.

Real-World Problem Defined

The term “real-world problem” has been tossed around so freely and easily in education circles these days that it has become little more than a hollow cliché. Because a good deal of the focus of enrichment clusters is on the pursuit of real-world problems, we feel obligated to provide the reader with as precise a definition as possible about this oft-used but frequently elusive (and illusive) term.

Enrichment clusters are designed to promote the kind of high-end learning described above, and a key concept in organizing and delivering services for this type of learning is *application*. High-end learning consists of *applying* relevant knowledge, research skills, creative and critical thinking skills, and interpersonal skills to the solution of real problems. But what makes a problem real? We define a real-world problem in terms of four essential elements.

1. Personalization of the problem. First, a real problem requires a personal frame of reference for the individual or group pursuing the problem. In other words, the problem must involve an emotional or internal commitment to action in addition to a cognitive or scholarly interest or simply wanting to find out more about something. Something that is a real problem for one individual or group may not be a real problem for others. For example, stating that global warming or urban crime are “real problems” does not make them real for an individual or group unless they decide to *do something* to address the problem. For these reasons, problems pursued in enrichment clusters must not be predetermined by the teacher or externally assigned. Teachers might help in problem finding and focusing, but students within the cluster should be the main decision makers for selecting the problem and the ways in which it will be pursued. This self-selection provides the ownership and commitment that is needed to work on the development of a product or service for an extended period of time. Teachers and other adults can provide guidance, but they must avoid crossing the line from suggestion to prescription. Divisions of labor within clusters allow individuals to specialize in some aspect of the problem and product, thus increasing opportunities for students to place a personal stamp on any given problem and product.

2. Open-endedness of the problem. A second essential element of real problems is that they do not have existing or unique solutions for the groups or individuals addressing the problem. If an agreed-upon solution, already existing right answer, or prescribed strategy for solving the problem exists, then it is more appropriately classified as a training exercise. Even simulations based on approximations of real-world events are considered training exercises if their main purpose is to teach predetermined content or thinking skills. Professionals solve problems in order to bring about some form of change in the actions, attitudes, or beliefs of a targeted audience or because they want to contribute something new to the sciences, arts, humanities, or other areas of human productivity. We use the word “new” here in a local rather than global way. It is not necessary for young people to make contributions that are new for all humankind. Replications of studies that have been done many times before can be new in a relative sense if they are based on new data gathered locally or a new wrinkle in the data that makes the study different from the work of others. For example, a group of young people who gathered, analyzed, and reported on data about television-watching habits in their community were contributing information that was new, in a local sense, even though similar studies had been done in other communities.

3. Authentic methodology and advanced content. The third essential element of a real problem is that the problem is addressed using authentic methods that applies advanced content—that is, by employing the methodology, knowledge, and materials typically used by investigators and creative producers in the various disciplines. Enrichment clusters ask students to assume the roles of practicing professionals to develop the skills of first-hand investigators as they apply cutting-edge knowledge and content from the area of study. These roles and skills may be at a more junior level than adult journalists, historians, artists, environmentalists, filmmakers, or other professionals, but they are clearly different from the typical school role of student as lesson-learner. Using authentic methods is critical because one of the goals of inductive learning is to help young people extend their skills beyond the usual kinds of products that often result when teachers and students view “research” as merely looking up and reporting information. Authentic methodology lends itself to authentic products.

Similarly, in an enrichment cluster, students construct meaning and consult advanced references and sources as professionals would. Though some reporting of previously known information is a necessary part of most investigations (in the professional world, the pursuit of new knowledge should always begin with a review of what is already known about a given topic), the end result should be a creative contribution that goes beyond existing information that can be found in encyclopedias, on the web, or in the “all about” books that occupy most library shelves.

Every field of organized knowledge can be defined, in part, by its methodology, and the methodology of most fields can be found in certain kinds of guidebooks or manuals. These “how-to” books are the key to escalating studies beyond the traditional report writing approach that often passes for research. In later chapters, we describe examples of these books and the ways in which teachers can access various sources of methodological information. Likewise, the content of a field is often organized in books about the specific topic, found on the web, and in current journals of the field. To obtain advanced knowledge, students and cluster facilitators alike can connect with experts in their areas of pursuit.

Every field of knowledge can also be defined in part by the kinds of data that represent the raw material of the field. New contributions are made in a field when investigators apply well-defined methods to the process of making sense out of random bits and pieces of information. Although some investigations require levels of sophistication and equipment that are far beyond the reach of student investigators, almost every field of knowledge has entry level and junior level data-gathering opportunities.

4. Authentic audiences. The final essential element of real problems is that they are directed toward real audiences. Real audiences are a major part of the *raison d'être* of the practicing professional upon which this model of learning and teaching is based. Professionals produce creative products for specific clients and audiences. Writers hope to influence the thoughts and emotions of their readers, scientists do research to find better ways to cure diseases or make better products, and artists create products to enrich the lives of those who view their works. Students within enrichment clusters also need to develop their work for a real audience. Audiences may change as the work evolves, but they serve as targets that give purpose and direction to the work. Any teacher who has been involved in the production of a school concert or play knows how anticipation of opening night focuses the preparation, precision, and quality of the performance. The same striving for excellence can be found in groups responsible for publishing a school newspaper, yearbook, or developing a community action project. A sense of audience contributes greatly to task commitment and concern for excellence.

Real audiences consist of people who voluntarily attend to information, events, services, or objects. What one group of students did with the results of their local oral history project illustrates the difference between a real and a contrived audience. Although this group first presented their findings to classmates, they did so mainly to rehearse presentation skills. Their authentic audience consisted of members of a local historical society and individuals who read about the student research in the local newspaper and a historical society newsletter.

The Assembly Plant of the Mind

Enrichment clusters consists of investigative activities and the development of creative products in which students assume roles as first-hand investigators, writers, artists, or other types of practicing professionals. Although students pursue this kind of involvement at a more junior level than adult professionals, the overriding purpose is to create situations in which young people are thinking, feeling, and doing what practicing professionals do in the delivery of products and services. Student-driven should achieve the following five objectives:

1. Students receive opportunities, resources, and encouragement to apply their interests, knowledge, thinking skills, creative ideas, and task commitment to self-selected problems or areas of study.
2. Students acquire advanced-level understanding of the knowledge and methodology used within particular disciplines, artistic areas of expression, and interdisciplinary studies.
3. Students develop authentic products or services that are directed primarily toward bringing about a desired impact on one or more specified audiences.

4. Students develop self-directed learning skills in the areas of planning, problem finding and focusing, organizational skills, resource utilization, time management, cooperativeness, decision-making, and self-evaluation.
5. Students develop task commitment, self-confidence, feelings of creative accomplishment, and the ability to interact effectively with other students and adults who share common goals and interests.

Enrichment clusters focus on the pursuit of real problems and should be viewed as the vehicle through which everything—from basic skills to advanced content and processes—comes together in the form of student-developed products and services. In much the same way that all the separate but interrelated parts of an automobile come together at an assembly plant, we view this form of learning as an assembly plant of the mind. This kind of learning represents a synthesis and an application of content, process, and personal involvement. The student's role is transformed from one of lesson-learner to first-hand inquirer, and the role of the teacher changes from an instructor and disseminator of knowledge to a combination of coach, resource procurer, mentor, and, sometimes, a partner or colleague. Although products play an important role in creating these authentic learning situations, the development and application of a wide range of cognitive, affective, and motivational processes are the major goals of this type of learning.

Key Resources

This brief excursion through the complexities of learning theory and the thinking behind enrichment clusters is important because it will help you understand the big picture of what we are trying to achieve through this organizational approach to enrichment. Although any change from the status quo is always a little intimidating at the start, we have achieved a fair amount of success by gaining faculty, administrative, and parental consensus on a small number of easy-to-understand concepts and related services and by providing resources and professional development related to specific service delivery procedures.

Enrichment clusters represent part of a general plan—called the Schoolwide Enrichment Model (SEM; Renzulli & Reis, 1997)—to develop the gifts and talents of all young people. Although enrichment clusters can be developed and implemented independently from the overall Schoolwide Enrichment Model, some of the underlying theory, research, and practical know-how surrounding SEM on developing gifts and talents can be useful to program developers for both background information and for expanding the continuum of services based on this common goal.

What Is an Enrichment Cluster?

How can educators squeeze in time for the highly engaging learning activities that make schools enjoyable, creative, and challenging places for students (and staff) in the face of twin realities: the pressures to raise standardized test scores and the ever-growing lists of prescribed standards, required content, and performance outcomes? Research carried out with numerous schools across the country (Reis, Gentry, & Park, 1995) indicates that this seemingly impossible task can be achieved by inserting a block of time of approximately 90 minutes into the school week during which high-end learning is the major focus of all student activity. In an enrichment

cluster program, educators use this block of time to focus on student-driven learning, turning students' attention toward authentic learning applied to real-world problems.

Enrichment Clusters Defined and Exemplified

Enrichment clusters allow groups of students who share a common interest to come together each week during specially designated time blocks to produce a product, performance, or targeted service based on that common interest. Enrichment clusters usually last for an eight- to ten-week time block. A series of clusters occurs in the beginning of the year, followed by a four- or five-week break and another series in the second half of the school year. By having all clusters take place during a designated "cluster time," all teachers and students can participate.

Depending on the number of students who sign up for individual clusters, some offerings may be repeated, and if student and teacher interest warrants, other clusters may continue. Clusters that are repeated should *not* be carbon copies of the original cluster. The topic may remain the same and some of the start-up activities can be similar, but student choices for product development and the ways in which they go about their work should evolve according to each particular group's interests and needs. Like the work of a painter or composer, each cluster should create itself. The canvas or the score sheet may remain the same, but each painting or composition is a new creation. Each cluster should be seen as an original. Otherwise, there is a danger of slipping back into a deductive mode of teaching.

Teachers or other adults who have a special interest in a particular topic facilitate the clusters. Students with advanced knowledge and interest in a specialized area can also serve as cluster facilitators, working in cooperation with teachers or other adults if necessary. (Student-led clusters have been most effective when older students work with younger groups, and we suggest a separation of at least three grade levels between student facilitators and students in the cluster.) All facilitators, including students and community volunteers, should receive some orientation and have a clear understanding of the difference between deductive (prescribed and presented) and inductive (investigative) or high-end learning.

As indicated earlier, clusters are modeled after the ways in which knowledge acquisition and application take place in real-world situations. In clusters, students make use of relevant knowledge and apply thinking skills to common problems identified by the group. The Video Production Company illustrates how students learn in their quest to address an identified problem with an authentic product or service.

The Video Production Company

Bill Bonfante, a middle school history teacher, has nurtured a strong interest in film making and video production since his college days when he was involved in a number of theater and video production activities. When the enrichment cluster program started, he wrote a description for a group he'd like to facilitate:

Sixteen students from grades six through eight selected this cluster because they were drawn to areas listed in the description. Early meetings of the group focused on selecting a topic for their first production, deciding who would work in the various subgroups (writing, filming,

editing, etc.) and what their responsibilities would be, and setting up a schedule of events. After some brainstorming sessions, the group decided to make a documentary about the Battles of Lexington and Concord and Paul Revere's ride. The target audiences for the video would be fourth graders who study this topic in their history class. Mr. Bonfante showed short segments of films and videos dealing with historical topics, he invited a parent who is a local television producer to talk with the group, and he obtained several how-to books and manuals dealing with script writing, storyboarding, video techniques, costumes, and make-up, and of course, historical descriptions of the battles and Paul Revere's famous ride. Students spent most of cluster time (90 minute sessions once a week) in small task groups, with short whole-group meetings to report progress and make entries on the master production schedule. In addition to a director who coordinated the overall shooting, two students served as producers, with responsibility for recruiting extras, locating and gaining permission for shooting, arranging transportation, recruiting parents for costume making, and acquiring resources (including a horse and rider).

As the facilitator of the cluster, Mr. Bonfante helped students focus the problem from a general area of interest (video production) to a specific topic (the battles and Paul Revere's ride). He also helped identify the jobs to be done, obtain the required resources, and develop an action plan. He worked with the group on developing interpersonal skills, running effective meetings, and developing time management skills. These activities were always student-driven, with Mr. Bonfante playing an advisory role.

Wherever possible Mr. Bonfante encouraged students to imitate or model the roles and responsibilities carried out by actual professionals working in the field of video production. Reference to how-to books or phone calls to individuals in the profession sought answers to questions such as "How would a film crew set up a shoot so there are no telephone poles in the background?" "How can you make a shoot during the day look like night?" "Where can we find out which British regiments fought here and what their uniforms looked like?" "How can you make a church in one location look like it is next to a body of water that is in another location?"

Division of labor enabled all students to have ownership of a component of the production and to find a niche that complimented their individual strengths, interests, and expression styles. Although various levels of talent and leadership emerged in the task groups, Mr. Bonfante continually emphasized that each person's specialty was valuable because of its essential contribution to the whole. At all times his role was to coach, support, and escalate the level of each subgroup's work without taking over or assertively directing the tasks. Like a coach, he used his experience to offer advice in the form of possible alternatives, predict problems and needs, arbitrate differences of opinion, and allow students maximum opportunities for decision-making. This role required a great deal of patience and restraint. He allowed students to experience frustration and struggle in order to turn challenges and setbacks into successes. He recognized that students must "own the problem" if they are ultimately to achieve the goals set forth in Chapter 1 and feel genuine satisfaction in their success. As the work of the Video Production Company evolved, Mr. Bonfante turned more and more responsibilities over to the students, and in many cases, he became adept at answering a question with a question.

Behind the real action of the cluster, Mr. Bonfante worked what might be called the politics of enrichment clusters. He spent some time examining the state's content standards so that he could document the value of his cluster as the activities related to those standards. He

connected appropriate standards to various cluster activities and developed informal criteria to document and determine student growth in various content standard areas.

Guidelines for Enrichment Clusters

There are eight guidelines that differentiate an enrichment cluster from a traditional course, mini-course, or unit of instruction. These guidelines can serve as a checklist against which you can evaluate whether or not a cluster is based on an inductive model of teaching and learning.

1. Focus on Application of Content and Process

This first guideline—The Golden Rule of Enrichment Clusters—demands that *all cluster activity be directed toward the production of a product, performance, or service for an authentic audience*. All learning that takes place within the cluster is only pursued for application purposes, whether that learning involves content acquisition, the use of thinking processes, or the development of leadership skills, inter- or intrapersonal skills, organizational and time management skills, or any other desirable educational outcome. This type of learning is what John Dewey (1939) called “collateral learning,” and its value is derived from the fact that whatever is learned—whether it be content acquisition or the use of thinking processes—is instantly relevant because it is necessary to address a particular problem. Products are the necessary vehicles upon which content and process are developed. The most enduring and transferable outcomes of this type of learning are the processes themselves, but products, performances, and services are the essential and defining elements of an enrichment cluster. However, even process goals should not predetermine what takes place in a cluster. Just as you want to avoid direct teaching to a content objective, you also want to avoid over specifying process outcomes. Otherwise, a cluster might end up focusing on activities like “Today’s Worksheet on Detecting Bias in Text.” Inductive teaching requires that process skills evolve as a result of product or service development requirements. The taxonomy is included for general orientation purposes to help teachers explain the purposes of clusters to students and parents and as a checklist to evaluate the cluster at its conclusion.

A Products Planning Guide (Renzulli, Leppien, & Hays, 2001) helps teachers explore a wide range of possible products in the following seven areas of product development: Artistic Products, Performance Products, Spoken Products, Visual Products, Constructed Products, Leadership Products, and Written Products. These lists have proven to be helpful to both teachers and students as they go about exploring the many options for expressing their work in alternative and creative ways.

2. Allow Students and Teachers to Select the Clusters in Which They Wish to Participate

Both research and common sense indicate that people learn better when they enjoy what they are doing, and a large part of enjoyment comes from being able to make selections from a number of available alternatives. When it comes to formal schooling, however, students have few opportunities to make choices. They may not know where their interests lie and have difficulty making selections. Several self-assessment instruments from the family of *Interest-A-*

Lyzers (Renzulli, 1997) help students get in touch with potential interests through a series of open-ended questions.

Because of the emphasis that enrichment clusters place on product/service development, it is also worthwhile to help students examine their preferences for various modes of expression. Once again, some students are already aware of their expression preferences, especially if they have been involved in musical or artistic productions or in extracurricular activities that require a particular form of expression style (e.g., school newspaper, art club). Other students will make more meaningful cluster choices if they are able to examine expression preferences, and even students with already established preferences might discover new avenues of expression through a self-analysis experience. To help students explore expression preferences, we recommend using *My Way . . . An Expression Style Instrument* (Kettle, Renzulli, & Rizza, 1998). This instrument, like the *Interest-A-Lyzers*, is not a test, and there are no norms or right or wrong answers. Rather, *My Way* helps young people understand their preferences and make better choices when given opportunities to participate in self-selected learning experiences.

It is not necessary to use these instruments with all students, but this process has helped students who are having difficulty choosing a cluster in which to participate. We have also found that after two or three series of clusters, re-administering these instruments can help students stretch out into new areas of interest and expression. These instruments can also provide more general information. When viewed in groups, interest inventories provide information about what types of clusters ought to be offered, and expression inventories help facilitators understand what range of product/service/audience options exist for cluster outcomes.

Effective teaching almost always takes place when teachers bring their own personal excitement, enthusiasm, and commitment into the classroom. Therefore, the same philosophy that guides student interests also applies to teachers and other adults who might facilitate enrichment clusters. In our early experimentation on enrichment clusters, we found that many middle-school teachers assumed that they should design clusters in the subject area in which they were currently teaching. These choices may be the best decisions for some teachers, but we also found that many teachers had interests and even strong passions about topics or areas of study that they always dreamed about applying to learning situations with young people who also share similar interests. To help teachers explore potential areas for developing their own unique clusters, we used a self-assessment instrument entitled *Inspiration* (Gentry & Renzulli, 1995). This instrument explores special interests and activities that may serve as idea generators for cluster development. This instrument helps teachers identify colleagues with complementary interests, allowing them to explore opportunities for working together. For example, a teacher with a strong interest in local history and another interested in creative writing might choose to team up for a cluster on historical fiction and dramatizations about early settlers in their region.

A small amount of time invested in interest and expression style assessment will contribute greatly to the success of a cluster program. We know from our own experience as both teachers and students that the classes we enjoyed the most, the classes in which we were most engaged, and the classes in which we usually learned the most were the ones in which the teachers and students shared strong interests.

3. Group Students Across Grade Levels by Interest Areas

Most of students' lives in school are spent with age and grade peers, but in the out-of-school world, people are almost always grouped by interest or common task areas. Because enrichment clusters make every effort to follow a real-world pattern of organization and learning, we strongly recommend that cluster enrollment range across two to three grade levels (and we have seen successful clusters that included four grade levels). In addition to providing a real-world-life environment, grouping students by interests allows for what scientists call a "critical mass"—bringing together as many of the necessary ingredients as possible to produce the best results. In a learning situation, more creative and dynamic interactions take place if a larger number of students with a common interest work together rather than separating the group just because they happen to be of different ages. Age becomes imperceptible when there are strong commonalities of interest, and many benefits result when, for example, a younger student's unpolished but creative idea is teamed up with an older student's know-how or extended experience in a certain segment of the task. There is also a very practical reason for cross-grade grouping. In one of the elementary schools involved in our research, a marvelous enrichment cluster in fashion design was offered across grades three through five. Because of time constraints and the availability of only one teacher who wanted to offer this cluster, it would have been impossible to have Fashion Design for Third Graders, Fashion Design for Fourth Graders, etc. In addition, the cluster would have lost the excitement and enthusiasm that twenty-two turned on students generated, something that ordinarily would not have taken place in three smaller groups.

4. Do Not Use Predetermined Unit or Lesson Plans

This guideline is perhaps the most difficult for beginning cluster facilitators to deal with, and yet it is crucial to follow if teachers are to prevent regression to a didactic model of learning that turns enrichment clusters into mini-courses. The absence of unit or lesson plans does *not* mean that there are no guidelines for general start-up activities.

During early experimentation on the enrichment cluster concept, we encountered a tendency for some facilitators to turn the clusters into mini-courses. Mini-courses are designed to teach a prescribed set of content or thinking skills to students (the Deductive Model). Mini-courses may differ from regular instructional units in that they deal with topics not ordinarily covered in the regular curriculum, and they may use teaching strategies that are different from traditional recitation, drill, and testing practices. However, the ultimate purpose of most mini-courses is to put into the heads of students a *preselected* set of content and/or process objectives. While this goal is not unworthy, enrichment clusters are something different.

An enrichment cluster is a learning situation that is purposefully designed to produce a product or service that will have an impact on an intended audience. All learning that takes place within a cluster—whether that learning is new content, new or improved thinking processes, or new interpersonal skills—is derived from the information and skills necessary to solve a real problem. In other words, students learn new material within the context of an authentic and present problem. In enrichment clusters, teachers must purposefully avoid prespecifying content or process objectives in order to allow students to follow the investigative methodology of practicing professionals in the real world. If teachers approach clusters by prespecifying what

and how students are going to learn, they would return to teaching practices that are typical of regular instruction.

Planning an enrichment cluster is, in many ways, an easier and more natural process than planning for traditional teaching. Cluster facilitators need only determine (through discussions with students) a product or service and an intended audience and then take the steps necessary to acquire the resources and know-how needed to produce the product or deliver the service. Information, materials, problem-solving skills, and assistance automatically become relevant because students require them to produce the product or deliver the service. Imagine for a moment all of the things about arithmetic, geometry, geography, architecture, purchasing, aesthetics, computer graphics, advertising, photography, accounting, cooperativeness, leadership, and ornithology that a group of elementary grade students can learn simply by deciding that they want to design, construct, and market environmentally friendly bird houses and feeders!

Enrichment clusters are modeled after natural (nonschool) learning, but a good deal of teacher training demands that educators begin by first stating objectives and learning outcomes and then design lessons to achieve those objectives. This traditional approach to pedagogy is a difficult habit to break. We hope that the suggestions for designing clusters in Chapter 4 will serve as a guide for using an inductive approach to pedagogy rather than the prescribed/presented approach that typifies most regular curriculum and mini-course activities.

A second problem we encountered in our research on enrichment clusters was a failure on the parts of some facilitators to escalate the level of knowledge pursued within a cluster. Hands-on should not mean brains off! We observed many exciting, fun-filled activities, and this kind of enjoyment in learning is unquestionably one of the most desirable features of a good cluster. At the same time, some critics decry certain clusters for being nothing more than “fun and games,” and others have said that the clusters are “soft on content” and that they don’t represent “real school.” Cluster facilitators can guard against these criticisms by examining each cluster with an eye toward what constitutes authentic and rigorous content within the field or fields of study around which the cluster is organized. For example, in *The Environmentally Friendly Construction Company*, the facilitator began by helping the students obtain some books on ornithology, marketing, and advertising as well as how-to books on birdhouse and feeder construction. The students studied maps to learn about birds indigenous to their area of the country and their migratory habits, they learned about the birds’ anatomy in order to determine how big to make the bird houses and openings, and they studied different kinds of preferred diets, colors, mating habits, and optimal locations. Students prepared display boards with attractive drawings and photographs to help market their products, and a subgroup within the cluster interested in desktop publishing produced printed material to accompany each bird house and feeder that was sold. The students became specialists in the various subtopics, the tasks required to develop high quality products, and the procedures for researching, constructing, and marketing their products. This pursuit of advanced content helps avoid the “soft on content” criticism that is inevitable in an age when standards and test scores are of primary concern to education leaders, and it is one of the reasons why we encourage students and cluster facilitators to document all advanced resources used in their work. Although high quality products are the best evidence of student achievement, even a list of advanced books used, web sites accessed, and resource contacts who contributed know-how will assist in documenting the level of rigor in the cluster.

Another example of content escalation comes from a group of students who were involved in a cluster on fashion design. Although the cluster focused mainly on designing clothing for teens, the students researched 100 years of fashion trends by decade and presented their findings on a History of Fashion web site. This historical analysis provided both a scholarly perspective to their work and generated creative ideas about the fashions they were currently developing. An authentic need for background information and the know-how for getting it (e.g., old magazines, Montgomery Ward and Sears Roebuck catalogues) raised the level of academic authenticity.

Making sure students pursue higher levels of knowledge and authentic methodology is a key role for the cluster facilitator. Although the facilitator does not need to be an expert in content areas beforehand, it is necessary to

- have an interest in the topic and a “feel” for content escalation,
- know how and where to find the resources that will advance the level of study,
- organize cluster activities so that knowledge escalation is pursued as part and parcel of the hands-on activities, and
- document the extent and level of advanced content that was pursued in the cluster.

Left to their own devices, the students in the birdhouse cluster might have skipped the underlying research in ornithology and marketing in favor of sawing, hammering, and painting. And the fashion design group might have missed the opportunity to develop advanced-level research skills and a broader perspective on their area of interest. If such were the case, the cluster experiences would have lacked opportunities for higher levels of learning and could easily have fallen prey to the “fun and games” criticism. In the cluster on building birdhouses and feeders, the facilitator’s suggestion that “a good marketing strategy” would be to include a user’s guide in each birdhouse and feeder created a genuine need to do the research in ornithology that raised the scholarly level of the enrichment cluster. The teacher did not instruct the students in ornithology, but rather guided them toward finding the information they needed from sourcebooks and the Internet to create their final products. We call this kind of search for resources *just-in-time information*: It is instantly relevant because it is needed to address a real and present problem. In many ways, these examples underscore the most important role of the facilitator. The escalation process demands more than merely guiding the hands-on aspects of a cluster; it requires that the facilitator offer creative suggestions about the direction of cluster work that guarantee that academic growth is a hallmark of the cluster.

5. Guide Clusters with the Authentic Content and Materials that Investigators and Creative Professionals Use

Most teachers can easily help students locate information about general and specific topics. In addition to the usual introductory resources, access to the Internet and the marvelous capabilities of search engines make a vast amount of information available to students of all ages. Unfortunately, far too many students believe that the only method for preparing a research project is to look up information in encyclopedias, other reference materials, and on the Internet. Looking up and making appropriate use of relevant background information is an important part of investigative work, but if it is the only method used, the end result is usually a report rather than authentic research. In order to engage in authentic research, teachers and students need to

learn how to find and use methodological resources. We frequently refer to these resources as “how-to” books or “Mentors-in-Print,” and they are essential for escalating studies beyond the traditional report-writing approach that often passes for research.

A how-to book or manual supplies information about how professionals in a particular field of study go about carrying out investigative, creative, or action-oriented work.

Choosing a Subject and Finding Information About It

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 beginnings 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?

There are hundreds of how-to books that focus on the how-to or investigative methodology of various subject matter areas. Most of them were written for young audiences or introductory investigators, and in most cases, they can be used as resource guides for students as well as adults who are facilitating a cluster. Cluster facilitators can also raise the level of rigor by obtaining introductory college-level textbooks in disciplines such as psychology, sociology, biology and the other fields of study typically included in college curricula. These books are especially helpful for identifying basic principles, major concepts, and the types of topics that are typically studied in a particular discipline. Some of these books also include laboratory manuals that guide students through actual research activities in particular fields of study.

Cluster facilitators can also ask professional in various fields for recommendations (but should be sure to mention the ages of students in the cluster so that recommended resources are appropriate for younger investigators). The Internet is also another source of methodological information. A teacher facilitating a cluster on local history helped his students prepare for interviews with Vietnam veterans by using what he described as “three clicks on the web.” Starting with the Yahoo search engine, he clicked on Social Science. In addition to listing numerous topics related to this general field, a dialogue box allowed him to type in and search for “oral history.” This second click yielded 52 site matches for oral history. He then clicked on one of these matches entitled “Oral History Questions.” To his amazement, he was presented with and was able to print out four pages of questions that would be appropriate for an oral history interview. Among the other 50 sites were descriptions of oral history projects, oral

history associations, university centers that provide resources to interested persons, and subtopics such as Vietnam Veterans and the Oral History of Jazz. What a resource! The world of advanced level information is literally at our fingertips, and facilitators can use it to escalate the level of content and investigative methodology in enrichment clusters and in all teaching activities.

Although some investigations require levels of sophistication and equipment that are far beyond the reach of students, almost every field of knowledge has entry level and junior level data-gathering opportunities. We have seen scientifically respectable questionnaire studies on food and television preferences carried out by primary grade students. A group of middle-school students gathered and analyzed water samples as part of a large regional study on the extent and effects of acid rain. This work was so thoroughly and carefully done that the students' findings were requested by a state environmental agency. Another group of elementary students used very professional techniques in every aspect of producing a weekly television show broadcast by a local cable television company. A fifth grade student wrote a guidebook that was adopted by his city's government as the official historical walking tour of their city. 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 bike paths. The success and high level of product development reflected in these examples can be traced to the proper use of authentic methods and techniques, even if these techniques were carried out at a somewhat junior level.

The facilitator's role in providing methodological assistance is to help students identify, locate, and obtain resource materials and/or persons that can help them with the appropriate use of investigative techniques. In some cases, cluster facilitators may need to consult with librarians or professionals within various fields for advice about where and how to find methodological resources. Facilitators may also need help from professionals to translate complex concepts into material students can understand. Although methodological assistance is a major part of the facilitator's responsibility, it is neither necessary nor realistic to expect facilitators to have mastered a large number of investigative techniques. A solid 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 students obtain the right material and the willingness to reach out beyond the usual school resources for specialized materials and resource persons.

6. Provide Opportunities to Develop Multiple Talents Within an Enrichment Cluster Through Division of Labor

In enrichment clusters, each student does not do the same tasks. There is a division of labor that models real-world productivity, and everyone contributes in his or her own area of interest and developing specialization. The group is connected by a common purpose, but each member makes a unique contribution to the overall enterprise. This guideline is easier to understand and implement by examining how various tasks are carried out in a business, theater production company, publishing enterprise, or community action agency. A dramatic or musical production group, for example, requires people to fill the obvious functions (actors, producers, directors), but many others in more background roles are necessary to create a professional production. Script writers, set designers and builders, business managers, costume designers, light and sound technicians, make-up specialists, fund raisers, and those who prepare advertising and publicity pieces all perform functions directed toward one goal—the final show. Because not

all students perform the same tasks, enrichment clusters make it possible for a group of students with different ability levels to work together. Students of varying achievement levels can work in the same cluster and all be challenged appropriately as long as they are allowed to contribute to the development of the product or service in a way that makes the most of their individual interests and abilities. Allowing students to pursue different tasks all aimed at a common goal also encourages interdependence, cooperation, and appreciation of others' strengths and talents.

The division of labor concept is valuable in cluster planning because it encourages teachers to help young people explore multidimensional projects. We have examined so called enrichment clusters that amounted to little more than each student preparing a fairly traditional report on the migratory habits of his or her bird of choice. But imagine how teaming up field observers, photographers, writers, artists, and background researchers could easily develop a broad range of talents and teamwork. Further imagine other talents in graphics, media, desktop publishing, teaching, and marketing that could be developed if the group decided to create a web site, a local birdwatcher's guidebook, and birdwatcher's workshops for other students or adults.

Although an enrichment cluster might have all students working on different jobs contributing to the same end product or service, it is not uncommon to have several different outcomes within a single cluster. Individuals and/or small groups of students might choose to move in divergent directions within the general topic area, thus creating several different products and services within the single cluster. A theater group or a newspaper production studio might be focused on a single product with different students carrying out different jobs that contribute to that one product, whereas an artists' guild might have individual artists each preparing a personal exhibit of their original works for a community arts festival. One enrichment cluster might generate a number of very different products and services. In one cluster on puppetry, some students became puppeteers and developed a traveling puppet show; others chose to teach the art of puppetry and making puppets to primary students; and yet another group published a book that chronicled the history of puppets.

Once the cluster has started, a field trip to or a visiting speaker from a local business, laboratory, production company, or other organization can be a good source of information for determining the range of participation opportunities within any general area of interest. Asking questions about different jobs, responsibilities, and products or services will quickly help students identify particular roles that students might like to fulfill. A little background work will help facilitators include a range of the possible types of involvement in their cluster descriptions. A phone call, visit, or even a casual conversation with someone who works in the general area around which you want to develop a cluster will provide the kind of insider's information that may not be apparent to people outside the field.

Facilitators must carefully craft cluster descriptions with consideration for all the possible roles and potential outcomes that might emerge once students arrive and begin to shape the cluster. Simply creating a description for a theatre cluster that calls for actors might leave the cluster in short supply of set designers, directors, writers, and publicity people. Similar problems might emerge with a newspaper guild that only attracts reporters. Does the following description serve to attract a variety of potentially talented and interested students?

7. Set Aside Designated Time Blocks for Enrichment Clusters

Student-driven learning can take place in any classroom, but the pressures imposed by top-down curricular requirements and today's emphasis on preparation for standardized tests place limits on the amount of inductive learning that can take place in most classrooms. In order to guarantee that all students have opportunities for real-world, high-end learning, we recommend that schools set aside specially designated time blocks during the week when inductive learning is "on the front burner" of all students' learning experiences. We found that a block of time ranging from a double period to one half-day per week will provide the time necessary for effective clusters. Scheduling all of the clusters at the same time allows for total faculty availability and the opportunity to create the critical masses of interested students.

Before modifying the school schedule, school leaders should bear two considerations in mind. First, teachers, administrators, students, and parents must value this type of learning. If it is looked upon as a frill rather than something that contributes positive skills to the overall repertoire of the developing young person, a proposal for an enrichment cluster program will meet with a great deal of resistance. Creating value and appreciation for the type of learning advocated in enrichment clusters requires thoughtful sharing of information about the goals of inductive learning with the entire school family. Every person involved in an enrichment cluster program—especially teachers (who will be responsible for facilitating most of the clusters)—should be able to participate in discussions on the educational value of inductive learning. It is important in these discussions not to pit inductive learning against contemporary concerns about standards and the school's overall goal to improve achievement test scores. Both goals of schooling are important and should be viewed as complimentary rather than competitive. Early discussions should focus on value issues so that groups do not get bogged down in practical implementation concerns, which can be considered once a decision has been made to go ahead with the program. Many good ideas for school improvement have been derailed because early negativity about "why we can't do it" has been placed in front of "why we should do it." Good capacity building requires that a majority of the participators agree that an enrichment cluster program fits in with their vision of a good school. If a majority of the faculty agrees about the value of an enrichment cluster program, implementation will be much easier and creative solutions to practical concerns will emerge in later discussions on program development.

A second and more challenging practical consideration is scheduling itself. When is the best time to schedule enrichment clusters? Once a commitment has been made to the value of this type of learning, the entire faculty should carefully examine the overall weekly schedule in order to brainstorm creative suggestions. Ideas might range from a regularly scheduled time block each week to rotating time blocks and even after school programs. Each scheduling option has advantages and disadvantages, and scheduling options should be approached on an experimental basis. If one approach to scheduling doesn't work, school leaders should consider other options.

An additional issue related to scheduling has to do with time for staff development and sharing. There is a good deal of interest these days in faculties coming together as "communities of learners," but the actual implementation of this very good idea has frequently manifested itself in book discussion groups or discussions about local or national education issues. Such endeavors can be valuable, but some time devoted to brainstorming and sharing innovative

solutions to real and present challenges will help a faculty develop a “can-do” attitude. The school’s regular staff development agenda should include sessions that focus on facilitating enrichment clusters and sharing ideas. Scheduling time for staff development and discussions about the program times will pay off in terms of shared expertise, renewed enthusiasm, and the generation of creative ideas.

8. Suspend the Customs of Regular Schooling

Many regulations and traditions guide schools and classrooms. We are not questioning the value of these traditions, but we want “cluster time” to be different from the regular school environment. Some of these differences have already been mentioned—cross-grade grouping by interests, a focus on products and services rather than acquisition of predetermined knowledge, and teaching that does not follow traditional lesson or unit plans. There are other customs that we want to avoid if enrichment clusters are to be qualitatively different from regular schooling. For example, group size may vary considerably from one cluster to another. One cluster may contain eight or ten students, while across the hall a cluster of forty students meets. The larger cluster might need two or more adult facilitators or simply a teacher who is at ease moving from one small group to another within the large cluster. Some clusters may need to be carried out in non-classroom environments (e.g., a day care or senior center, a local business office or theater, or outside on the school grounds). Because clusters are modeled after learning that takes place in the real world, the environment should fit the students and the cluster topic rather than forcing the students and topic to a particular environment. And even within regular classrooms, furniture and equipment should be rearranged to accommodate the task requirements. Although clusters usually last a designated number of weeks, some clusters may require more time. One cluster that developed a television production company that aired a weekly program on a local cable access channel lasted six years! New students joined the company as others moved on to high school, but the success, enjoyment, commitment of the facilitators, and ever emerging professionalism on the parts of the students was the best reason for allowing the cluster to continue for an extended period of time.

The goal of this guideline is to make the type of learning, the environment, and the entire atmosphere of enrichment clusters as unschool-like as possible. Such a goal is not a criticism of regular schooling as much as a way to enhance those things that make inductive learning a more natural chain of events in the overall high-end learning process.

Concluding Thoughts

Like a garden that flourishes, spilling over its edges, the enrichment cluster programs implemented in pilot schools spread beyond their initial frames. Teachers brought methodology and content learned in clusters to their regular classrooms, and students sought out teachers who shared special interests or worked on cluster-like projects on their own at home. One art teacher said she looked forward to doing clusters again because she felt she was able to expose many students to things that they normally wouldn’t be able to do within the curriculum. She had many students come to her for help after the clusters were over or bring her things they had created on their own.

The majority of the staff at both pilot schools believed that the enrichment clusters were a positive addition to the school and chose to schedule clusters for the following year. Schools with established enrichment cluster programs served as models for other schools that were interested in beginning a cluster program as a way to implement one component of the Schoolwide Enrichment Model. Due to reports in area newspapers, news of the cluster program spread and similar programs were implemented in other schools. At least seven districts modeled their new cluster program on visits to the two urban districts that participated in this research.

These cluster programs were organized with little effort or cost, and the greatest challenge to implementing the program was finding a common block of time for all teachers and student to participate in the program. Enrichment clusters have great potential to provide student-driven, high-end learning to all students, and our research has shown great benefits to students and their teachers. An education in which students focus on their strengths, interests, and talents, applying them to real-world products and services for authentic audiences, ought to be expected for our youth and their teachers. Enrichment clusters are an exciting new way of delivering on a promise to help each child reach his or her fullest potential.

The following key resources provide valuable information about the Schoolwide Enrichment Model and Enrichment Clusters:

- Renzulli, J. S., & Reis, S. M. (1997). *The schoolwide enrichment model: A how-to guide for educational excellence (2nd ed.)*. Mansfield Center, CT: Creative Learning Press. This resource offers practical advice for achieving educational excellence in today's schools through an SEM program.
- Renzulli, J. S., Gentry, M., & Reis, S. M. (2002). *Enrichment clusters: A practical plan for real-world, student-driven learning*. Mansfield Center, CT: Creative Learning Press. This book contains the rationale, guidelines, and procedures for organizing an enrichment cluster program. The book contains numerous forms, sample documents, and staff development activities for preparing teachers to facilitate effective enrichment clusters.
- Purcell, J. H., & Renzulli, J. S. (1998). *Total talent portfolio: A systematic plan to identify and nurture gifts and talents*. Mansfield Center, CT: Creative Learning Press. Keeping Total Talent Portfolios for students helps schools assemble important information about students' abilities, interests, and preferences that aid teachers in deciding which types of enrichment and acceleration options will most benefit students.
- Reis, S. M., Burns, D. E., & Renzulli, J. S. (1992). *Curriculum compacting: The complete guide to modifying the regular curriculum for high-ability students*. Mansfield Center, CT: Creative Learning Press. Teachers learn how to streamline the regular curriculum in order to provide time for more challenging enrichment and acceleration activities.
- Renzulli, J. S. (1997). *Interest-A-Lyzer family of instruments: A manual for teachers*. Mansfield Center, CT: Creative Learning Press. This manual describes six interest assessment instruments that invite students to examine present and potential interests and explains how to administer and interpret these tools.

- Renzulli, J. S., Rizza, M. G., & Smith, L. H. (2002). *Learning styles inventory: Version III*. Mansfield Center, CT: Creative Learning Press. To help teachers identify student preferences for common instructional techniques, this manual details how to administer and score the *LSI* instruments as well as the theoretical rationale for identifying learning styles.

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