SAGE 1990

ENERGIZING POTENTIAL

CONFERENCE PROCEEDINGS

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The Society For The Advancement of Gifted Education

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CONTENTS

Developing Visual Literacy - Start it Young

Kay Anderson

I was working with high school students when I first thought about this topic. As I worked with these teenagers, I observed that a great many of them had a very limited way of seeing things. This often led to their frustration when working with images and trying to solve visual problems. It appeared as though they were almost handicapped in their practical way of seeing. They looked at objects just long enough to identify them.

Around the same time I was working with a group of early childhood teachers. A large part of their curriculum deals with "reflection" or teaching young children ways of seeing and responding to images in their natural and man-made environment. It seemed so obvious that this was exactly what my high school students were lacking. If they had had this early awareness to visual qualities they might not be having these problems today. Becoming sensitive to the visual world would not only help them to understand what they see but be more aware of the details and qualities they were missing in their environment.

These limited visual observers were really quite visually illiterate. Sure, they could identify images but they couldn't see, understand, and enjoy their qualities.

Visual Literacy

What does it mean? Literacy according to the dictionary, means being able to read, write and understand the printed word. Visuals deals with images--they might be real or created. They might be in our natural or man-made environment. Then, for the purpose of this talk, I define "visual literacy" as being able to understand images in one's environment.

to understand all the qualities these images communicate and to be able to express this information through talk or images. If we think of images as a means of communication, then we can communicate through images and images communicate to us. This doesn't mean we all have to be artists to become visually literate no more than it means that we all must be authors to be literate. We can be readers and writers. Visual literacy is learning to see and make sense out of all the images in our world and to understand and respond to their visual qualities.

From the moment we are born we being to see. Infants eyes are bombarded by sensations of color, shape and texture. They don't know what they mean, but soon through experience they learn to recognize thousands of different things. Objects become so familiar they can identify them from many angles.

Later, their eyes are taught to read and they learn symbols and can put them together to form words. They begin to interpret messages from just looking at our faces happy or sad. They dream and think in pictures. By the time they are eight or nine their sight is automatic.

Young children are naturally open to their environment. It is as we mature that we grow more inhibited.

Sight or seeing has to be classified in these four ways:

1. Practical Seeing: This is the type of seeing you do in order to go about your daily life. You see a chair in order to sit on it, to move it, or maybe to avoid walking into it.
2. Specialized Seeing: People who are specialists will usually perceive images according to their training. A steel bridge will oe seen one way by an engineer who built it, and another way by a motorist.

3. Reflective Seeing: When we hear a word we often find our minds filled with images we associate with that word, also, certain scenes or objects when viewed will start a chain of reflections in our mind. Reflective seeing is a very personal way of seeing because it involves our imaginations.

4. Pure Seeing: When we speak of developing a visual awareness, we are actually referring to the development of pure seeing. This kind of seeing refers not to 'what does it look like?', but 'how does it actually look.'

We want to motivate children to do more than just look and name things.

It is this pure seeing that I am talking about today. We as parents and teachers can foster experiences that will guide children to discover and respond to visual forms. These experiences will help them gain more knowledge, appreciation, understanding and enjoyment from their environment. Visual literacy means not only recognizing objects and their qualities and working with images, but being able to talk about them. If we think of images as means of communication, they can tell us many things.

The language of vision has a basic grammar and vocabulary. It deals with the elements and principles of design: color, line, shape, texture, pattern, balance, emphasis, contract, unity.

If this vocabulary is introduced early in a child's life, it becomes part of their stored knowledge which is used whenever dealing with images either in nature or in their designed world.

Everything you need to get children to respond to elements or principles of design are around the house, the yard, the school, or the neighborhood. All we need to do is get them involved in seeing and using

the vocabulary of vision. We need to get them involved in searching out this visual information.

** Take a nature walk and pick our the variety of lines you see.

** Send them on a treasure hunt to search out interesting shapes, forms, colors or textures.

** Create a visual dictionary.

If the real things aren't available, scout out garage sales for old issues of quality magazines such as National Geographics or Equinox. They have excellent photographs of plants and animals. The first steps in educating vision is encouraging children to seek out and gather visual images.

** Take a walk in a used car lot or a parking lot. Examine the variety of radial patterns in hub caps or look at the different line designs on the grill work of cards.

** Kids collect things from dolls to posters. Looking at collections of things is a chance to make stylistic comparisons of objects that share a common function but each is unique in appearance.

** Collect patterns in fabric or clothing or wallpaper. Draw their attention to similarities in nature. Repeated motifs found in man-made objects are often borrowed from nature.

The second step in educating vision is getting them to classify what they have observed or collected. Challenge them to see similarities and differences. Use questions that will stimulate specific detailed information. This helps to avoid confusion resulting from too many different visual stimuli. Motivate children to focus on pertinent sources of information available from images. Direct them to look for subtle colors in winter snow

or delicate patterns in leaves, or a bird's graceful movements, ripples on a pond, or majestic cloud formations

Lets take one of the elements, color, and look at what we specifically want them to know. Young children learn to recognize the names of colors. Why not include similarities and differences? Colors can be light a tint or dark a shade. There are many variations in one color. All secondary colors can be made from the three primary colors. Colors can create a mood. There are complementary, monochromatic, analogous colors. Do you think this is too difficult for young children? I've known five-year odds who know the names and recognize the shapes of all the dinosaurs and constellations. Why can't they learn about happy colors, quiet colors or contrasting colors.

Try playing this game. What is your favorite color? Think about it for a moment. Try to imagine how you might describe it. If you just say "blue", one person might think sky blue when you meant ink blue. You score a point each time you can think of a word to describe the color. The word is "brown". I've got one--toast brown. Now it's your turn _____ brown. You go around the circle until no one can think of any more, then you change to another color.

The best way to become aware of color is to be given the opportunity to mix colors. How many values of red can you make--a little white, a lot of white. What happens when you mix opposites or complementary colors. Introduce a simple color wheel. Suggest children make a collection of things that are green from magazine pictures. Arrange the collection from light to dark.

Remember to keep instruction informal at an early age. Allow students to search out information through experimentation with paint.

Allow them to gather and classify examples of color and use color in their own image development. Introduce the vocabulary gradually. Did you know you are wearing complementary colors today, yellow and purple? I like the shade of red you're wearing. Did you notice how the grass looks darker in the shadow of the tree than in the sunlight?

Another area that can aid in making our children more visually aware is drawing their attention to advertising.

A simple exercise which might use the yellow pages of the telephone directory, newspapers or magazines is a logo search. Introduce your students to the four kinds of logos in advertising. Logo that just uses a name is called a logotype. The pictograph type uses a picture and sometimes includes the name. The alpha type uses initials, and the abstract type uses symbols. Then there are combinations such as a picto-alpha. Have children examine these logos used on almost all the products we use. Collect logos, classifying them according to logo types.

Have students look at advertisements in magazines--how does the graphic artist that designed this advertisement get you to focus on the product. Talk about centre of interest, contrast of color, repetition, size, shape or texture. Collect advertisements that illustrate color contrast or repeated shapes to capture the viewer's attention. Try to guide the children to see visual clues which will develop their visual awareness.

Introduce your children to works of art. Artifacts can be like people--they can speak to you, they can make you feel happy, angry, shocked or calm. They might startle you, make you laugh or cry. They help you see places you might never visit and meet famous people. All of us, like children, know what we like and dislike in pictures. Very young children like pictures that tell a story. Most children, like many adults,

prefer realistic art because they can understand it more easily. Children enjoy studying other cultures, they tend to hero worship and would prefer a poster of a rock star to a Rembrandt. They love comic books and begin to accept art based on nature.

We can guide children to understand and appreciate even some of the more abstract works. We must acknowledge and explore children's art preferences but not restrict ourselves to them. We should attempt to expand children's preferences.

Research shows us children can overcome dislikes of some styles of art if given the opportunity to experience them with some understanding.

We need to help children enjoy artifacts and to help them find the words to describe what they see and see how the parts fit together to make a composition.

What is a painting? Most people at first see it as a picture of something. But the subject should be only a point of departure. Sometimes when we first look at it we get a vague idea of what is going on--but painting can also communicate a mood, an expression of time, an interpretation of symbolic reference. No two people react to pictures the same way. Each person individually will react in their own special way. Remember when you question children about a picture your aim is not to get consensus but to stimulate them to look and see more carefully and to encourage discussion.

First, allow children to take an inventory of what they see being as objective as possible. "What do you see?" "What else (shapes, lines, color, etc.) do you see?" Then, depending on the ages of the children you can discuss the principles of design. "How is it organized?" " What kind of balance?" "Is anything emphasized?" "How is unity achieved?"

Then, move on to "how does it make you feel?" "What does it communicate to you?" Remember to encourage diverse opinions and encourage them to make associations; "does this remind you of anything?" "What do you think happened next?" "Do the images remind you of any sounds or smells?"

Keep in mind that visual literacy is based on being able to see the qualities of images and being able to talk about them and use them to make sense of their world in a more meaningful way.

Help children discover the world of art by inviting them to play detective with pictures. Young children can see differences in line and variations in shape and color. They enjoy discovering rich detail, patterns, and the effect of light on form. They enjoy the tactile qualities of surfaces and can be encouraged to describe simulated texture in a picture.

You may not have the budget to buy famous original art works, but less expensive reproductions are available. When you or your friends travel pick up post-card size reproductions at art galleries and museums. Art reproductions also appear on greeting cards.

There are many games and guizzes to play to help children discover the world of art. Best of all, they discover the world of images.

Children can be made aware of the language of vision at a very early age. Given the opportunity they will grow into the habit of seeing more than the name of an object. They become sensitive to these elements and principles that make seeing so much more. They will develop a deeper and more meaningful perception. Our sight is influenced by our experiences, personality and culture. By playing visual games that will stimulate our children's perception, they can begin to see images beyond just the

surface levels and help them respond to visual forms. It will expand the brain and enhance their lives.

We all see, but as a famous poet once said, "genius is the capacity to see ten things where the ordinary man sees one....the man of talent sees two or three."

Building Provincial Exams to Challenge the Gifted

Dennis Belyk

OVERVIEW

Several initiatives in the Student Evaluation Branch directly challenge gifted students and support teachers in doing so.

1. Of central importance is the nature of the tests themselves, which reflect specific standards of performance and allow students to actually demonstrate what they can do. Several cognitive levels are reflected in the tests, and the emphasis has been increasingly on the higher levels.

2. Also important is the teacher involvement in developing the tests. Extensive inservice for teachers is a byproduct of their involvement. As a result, teachers are more able to challenge their students on a day to day basis.

3. Teachers and schools are also supported by the information provided in the testing bulletins and in the reports that follow testing. In addition, published samples of student writing provide an indication of the standards reflected in the tests. The writing samples indicate the range of performance that can be expected from students of various levels of ability and competence, including those who are gifted.

4. Diagnostic evaluation materials support teachers provide means of observing students and evaluating their learning from day to day. These programs allow teachers to discover specific strengths and weaknesses of individual students and to plan instruction that maximizes their learning.

1. NATURE OF THE TESTS

Two aspects of a test ensure that gifted students are challenged: the cognitive levels of the test items and the criteria for marking.

A range of cognitive levels is addressed in each test. This is outlined in a test blueprint which specifies the proportion of items that are devoted to each level. The higher cognitive levels are emphasized, as the following tables show.

Percent Emphasis Given to Various Cognitive Levels
Achievement Tests
1988-89* and 1989-90

Subject	Cognitive Levels	
	Knowledge	Higher Levels
Mathematics (Grade 3)	22%	38% Comprehension 18% Application 22% Problem Solving
Science (Grade 6)	25%	75% Comprehension and Application
English Language Arts (Reading) (Grade 9)	10% Literal Understanding	30% Judgment 60% Inferential Understanding
Social Studies (Grade 6)	44%	44% Inquiry Skills 12% Valuing Skills

* Social Studies only

Percent Emphasis Given to Various Cognitive Levels
Diploma Exams*
1989-90

Subject	Cognitive Levels	
	Knowledge	Higher Levels
Mathematics 30	9%	31% Comprehension 46% Application 14% Analysis, Synthesis, & Evaluation
Biology 30	25%	55% Comprehension & Application 20% Analysis, Synthesis, & Evaluation
Chemistry 30	30%	50% Comprehension & Application 20% Analysis, Synthesis, & Evaluation
Physics 30	25%	50% Comprehension & Application 25% Analysis, Synthesis, & Evaluation

English 30 (Reading, multiple choice)	10% Literal Understanding	60% Inference & Application 30% Evaluation
English 33 (R ding, multiple choice)	10% Literal Understanding	70% Inference & Application 20% Evaluation
Social Studies 30 (Multiple choice)	51% Recall & Comprehension	43%% Inquiry Skills 6%% Valuing Skills

*Math and sciences figures based on the whole exam; English and social studies figures based on the multiple choice section only.

In addition to the emphasis on higher cognitive levels, the social studies and languege arts tests include written response items. Diploma exams in mathematics and the sciences also include written responses. The written-response questions extend the range of possible responses and tap what each student really can do.

For the language arts written-response questions, the criteria for marking relate to content, organization, sentence structure, vocabulary, and conventions of writing. On the basis of these aspects of writing, five skill levels are described:

5 - Excellent
4 - Proficient
3 - Satisfactory
2 - Limited
1 - Poor
INS - Insufficient

For the written-response questions on the social studies achievement test, marking criteria differ for different types of questions. Some questions require a fairly brief written response that identifies the elements of an issue. These questions are marked mainly on the basis of the content of the response.

Other questions, however, require an extended response. Marking criteria for these questions relate to the following dimensions:

- persuasiveness and logice of supporting arguments
- quality of language and expression

The social studies diploma exam requires students to write one extended written response defending a position on a given issue. For this written work, scoring criteria are related to defence of position, discussion of value positions, presentation of examples or case studies, and quality of language and expression.

Five skill levels are described, similar to those used for scoring the language arts tests ("5" - "Exceptional" to "1" - "Poor").

2. TEACHER INVOLVEMENT IN TEST DEVELOPMENT

The blueprints for the tests are developed by Alberta Education staff, on the basis of curriculum specifications derived from the program of studies. However, the test questions themselves are developed by teachers. In the process of item development, teachers have the chance to scrutinize the curricula for their subjects very closely. There is an opportunity to reflect on the course objectives and the expectations and to discuss these with colleagues.

Evaluation and instruction truly come together in these discussions. The teachers develop an increased awareness of the full range of skills that might be expected of students. As well, the teachers can visualize what their gifted students in particular might be able to do. The result is the development of questions with various difficulty levels that challenge students at various levels of ability. More difficult questions are designed to challenge the strong academic and gifted students.

3. REPORTING RESULTS

Besides their involvement in test development, teachers receive instructive information from the Student Evaluation Branch in the form of bulletins and reports. The bulletins describe the testing program in each of the subjects. Cognitive levels of questions are described and sample questions are provided for the various components of each course. The blueprints for the tests are included, as are the criteria for scoring.

Following the testing, detailed reports are provided. They describe the results in relation to the specific categories of knowledge and skill that were represented in each test. Commentary about the results is included as well.

In addition to these reports, samples of students' written responses in language arts and social studies are published. The samples demonstrate the standards underlying each of the five skill levels.

All of these materials provide concrete and specific indications of what is expected of students. All teachers, not just those who were involved in test development, can gain an increased awareness of what students can do, and what is reasonable to expect of gifted students specifically. Teachers and other educators have regularly expressed their pleasure about the usefulness of these materials in heightening their awareness of curricular expectations and student potential.

4. MORE THAN ONE DIMENSION TO ASSESSMENT/EVALUATION

Testing provides predominantly summative information about learning outcomes. This information serves as an indicator of areas that might warrant more careful observation. It is the careful assessment of students' performance from day to day that reveals individual students' strengths and weaknesses. Diagnostic evaluation is therefore also a critical element in serving the needs of all students, including the gifted.

To support teachers in this important aspect of student evaluation, the Student Evaluation Branch has established its Diagnostic Evaluation Program. At the elementary level, the Diagnostic Reading Program has been available since 1986, while the Diagnostic Mathematics Program is ready for publication this fall. Both of these programs provide not only means for finding out on an individual basis what children know and can do; the programs also provide instructional strategies that help teachers to relate the evaluation to instruction so as to maximize students' growth.

A third diagnostic evaluation program is about to be piloted with students in grades 7 to 10. This program is intended to help teachers in all subjects to evaluate students' learning and language skills.

Teachers participating in the field testing have commented on the program's usefulness in revealing the ways that language supports learning in their subjects. Some have expressed surprise at the insights they have gained about individual students, and pleasure at the way their teaching has changed as a result.

This feedback suggests that all students may benefit from teachers' use of the program. Gifted students in particular stand to benefit if their teachers have a means of identifying and encouraging these students' particular strengths.

Advocacy and Lobbying: An Exercise in Persuasion

Patricia Boyle

Our society has a voracious appetite for information. Advocacy and lobbying are two specialized activities that allow citizens to share important information on social issues like education and the environment with decision-makers. Although some opponents may try to dismiss advocates and lobbyists as "one-issue pressure groups", their actions are a necessary and positive part of the whole democratic process.

An advocate seeks support for a cause. Advocates use many routes to champion their causes, such as articles, speeches, newsletters and meetings. In politics, lobbying is the logical extension of advocacy. A lobbyist seeks to influence the decisions of politicians or senior bureaucrats. There is a long and honourable tradition of lobbying in Canada. Politicians and senior administrators expect to be lobbied. In fact, they need the detailed, grass-roots information that lobbyists can give them. Lobbying, then, can be a very efficient way for politicians to learn more about today's complex social problems.

All politicians and most senior administrators are generalists. They have broad knowledge about their areas of responsibility, but they often lack specific information on issues or an awareness of the local impact and the possible long-term consequences of their actions. By lobbying, an advocate can provide this sort of valuable information, and, at the same time, help to promote better decision-making.

The essence of lobbying is cooperation, rather than confrontation. Because the lobbyist can offer information that may be very helpful to the politician or administrator, there is an incentive to work together for mutually satisfying solutions. Financial constraints, of course, have to be faced by both parties. The lobbyist must be flexible and realistic in assessing the chances for a successful outcome, to offer alternatives and, if necessary, to accept compromises gracefully. With cooperation, a working relationship based on trust and continuity of contact will be established between the players.

The most effective lobbying takes place in person. Telephone calls and letters are integral parts of a lobbyist's repertoire. A personal interview, however, means that you can hold the attention of a decision-maker, ask and answer questions, assess the body language and tailor your points carefully. What follows are some helpful steps to make the most of your personal interview.

For an interview, planning ahead is essential. You need a clear objective for the meeting, and correct, relevant information to support your position. The information you have amassed needs to be succinct, not too detailed. Prepare an executive summary to leave behind, and highlight important points. Politicians and administrators are very busy. You want to give them accurate and helpful information quickly and easily. Giving an anecdotal case study will put a human touch to a problem you want to address. If there are cost implications in your proposal, it is useful to calculate them. It is also important to anticipate possible objections to your position.

Although most politicians and senior administrators run late, it is important to be punctual for your appointment. When you meet the decision-maker, make physical contact by shaking hands. As most people are visual learners, they appreciate visual prompts for remembering a name. If you have a business card, then, offer it to help the person remember who you are, what organization you represent and how you can be contacted. When you are introduced, make sure that you know the name of the person you are lobbying! It is not unusual for electors to mix up names, especially if the elected official is a part of a board or council.

When you present your case, be brief. You probably will be allotted ten to fifteen minutes. Your preparation and intimate knowledge of the subject will allow you to speak with confidence. Use notes to help you remember the main points. While you will know far more specifics about your issue, the decision-maker will know more about the context of your issue - whether it will fit into the priorities of the organization or government, whether it might be financially feasible, and whether there may be some sort of consensus around the issue. While acknowledging your self-interest, as a parent, teacher or concerned citizen, you can certainly invoke the interests and welfare of others in showing the value of your proposal. Will it be good for children? Will it enhance the community? Will it help a disadvantaged group that has "fallen through the cracks" of the present system?

Politicians and bureaucrats, especially these days, hear a lot of complaints. In fact, many spend more time putting out brush-fires and dealing with complaints than on the more positive role of policy-making or policy-implementation. Your lobbying will be more effective, then, if you tap into the affirmative aspects of their jobs. Present suggestions for new policy initiatives or different delivery modes. Above all, stay positive and constructive. Concentrate on what can be, not on what has been. These people want to know what can be done right, not what has gone wrong.

It is prudent to stay on topic. While you are lobbying, your issue is a common concern, about which you hope to reach some level of agreement. If the conversation strays to other subjects, you may find yourselves with opposing views that are strongly held and irrelevant to your cause. Stick with commonalities, and don't risk disagreement. Make your points clearly. If you sense that you have an unsympathetic audience, stay calm and polite. The person may need a chance to confer with colleagues or to think about the merits of your case a little more. There is always a possibility that the decision-maker will see the wisdom of your arguments later. Ask if there are any questions, and if you can't answer them, respond in writing later.

Lobbyists rarely receive any sort of immediate commitment for their issues. Instead, they have to wait for political or bureaucratic assessment, consultation and evaluation. In an interview, it may be tempting to tell an elected official how to vote on an issue or to threaten to withdraw support in the next election if a vote isn't forthcoming, but the reasonable course is to refrain from both these actions. You want to be perceived as positive and helpful at all times.

Politicians and bureaucrats do not act alone. They act as part of boards, caucuses, councils and committees. One person's support, then, may not signal success for your lobbying efforts. If a collective decision of a board, etc., fails to support your position, you will get good political mileage if you thank the person(s) who argued on your behalf and acknowledge the fact that individuals are bound by group decisions.

Lastly, decision-makers will appreciate if you lobby by appointment only. They are very busy people, with little time for their families and friends. They need their privacy at the supermarket, the mall or on the street. Although we may sometimes see them as symbols of administrative or political power, they are people too. They can feel alone, vulnerable, upset or confused, just like the rest of us. By their own choice, they live in a

world of stress and conflict. If you respect their privacy and understand the tensions of the job, they will be more receptive to your position in the long run.

In summary, your position as an advocate and lobbyist will be enhanced if you are well prepared, brief and positive. An understanding of the context in which politicians and administrators operate will allow you to keep your expectations geared to political reality. If you consistently offer clear, helpful information, you will build a constructive relationship that will serve your cause well.

Program Continuity and Curriculum Differentiation

Jim Brackenbury

For the past five years, Alberta Education has been designing new and revised curricula to reflect the policy expectations of "Secondary Education in Alberta", issued by the provincial government in June, 1985.

Included amongst the many considerations involved in designing new and revised programs have been:

- careful attention to the developmental appropriateness of curricular expectations;
- clear specification of expected learner outcomes;
- provisions for adapting curriculum to meet the wide range of student needs and abilities;
- careful attention to continuity in learning experiences from program to program and from grade to grade;
- explicit integration of technology as a teaching, learning and delivery tool.

Program Continuity

Students need a sense of connectedness in their learning - how what they're expected to learn in one class today relates to previous learning and to learning across the subject areas.

A number of initiatives have been taken in designing provincial curriculum to improve the continuity of students' learning experiences:

- as programs are developed, they're carefully screened for developmental appropriateness, including the sequencing of skills and concepts;
- care has been taken to identify learning expectations on a grade by grade or level by level basis (these enable clearer judgments as to whether a student has met the expectations at a particular grade or level);
- programs (and program requirements) are being designed with greater opportunities for flexibility in terms of student placement. The Senior High Handbook now permits not only the waiver of prerequisite credits but also retroactive granting of credits. Several junior high complementary courses have been designed on a modular basis, at different levels of difficulty. This enables the individual placement of students into modules and levels reflecting individual needs and abilities;
- as courses have been developed, explicit connections with other courses have been built in. We have some excellent examples of this in junior high - both between core courses and between core and complementary courses. Several of the new complementary courses are designed to build on and extend learning from core courses.

Curriculum Differentiation

Although current programs are clearly defined in terms of expected learning outcomes, there remain rich opportunities to respond to the diverse needs of students:

- elective component of courses. Every course is designed to include provisions for adaptation to meet the individual needs of students (the new junior science program and textbooks provide excellent examples of this).

- selection of complementary courses. The current array of junior high complementary courses affords a rich array of intellectually stimulating, exciting and challenging experiences - ranging from Ethics to Agriculture to Computer Studies to Drama and, yes, to Environmental and Outdoor Education. Each one of these builds on a high level of student interest with careful attention to the intellectual integrity of the subject area.

- variety of learning resources, and increasingly within learning resources, provisions for differentiated activities by individual students

- at the senior high level, alternative course sequences (e.g., math, science, social studies, language arts)

- provisions for locally developed courses at senior high and locally authorized courses at junior high (e.g., International Baccalaureate)

- extending or complementing provincial courses through addition of local components or by assigning extra instructional time to particular subject areas e.g. junior high "flex" time within 950 hours

- providing alternative methods of school organization that best suit the needs of their students. For instance, jurisdictions are encouraged to adopt alternatives to the current Carnegie Unit organizational model (one credit = 25 hours of instructional time) at the senior high level where the alternatives are in the best interests of individual students.

- offering alternative programs that may emphasize a particular language, culture, religion, or subject matter, or use a particular teaching philosophy (section 16 of the School Act)

Section 44 of the School Act permits a board to develop and offer courses, programs, or instructional materials for use in programs or in schools, subject to standards that the Minister may prescribe under Section 25.

Conclusion

We believe that current curricula in Alberta provide significant opportunities to stimulate the giftedness in all of our students and for the special gifts in each to emerge. Programs like our new junior high science are designed to allow for personal self discovery, exploration, risk taking and a sense of personal accomplishment.

No program, however well conceived, and no instructional resource can or should be designed as "teacher proof". That's why we'll continue to depend on the teachers of this province as the real key to bringing out the giftedness of our students.

Resources for Parents

Barbara Brydges

The telephone in the Centre for Gifted Education rings almost daily with calls from parents of gifted children. The questions vary - many parents are concerned about whether the schools are meeting their children's intellectual needs; some want confirmation of their intuitive, and usually correct, judgement that their child is exceptional; others seek advice on how they can help their children deal with less gifted peers or siblings. In the end, all the questions come down to how they, as parents, can assist their children to reach their individual potential.

The purpose of this presentation is to provide an introduction to some of the resources, in the form of books and community groups, which are available to parents seeking information and support. The suggested readings have been selected both to provide parents with a general knowledge base about gifted children, and to address specific common concerns such as providing sufficient stimulation for preschool gifted children; overcoming underachievement; the special problems associated with being a gifted girl; or the dilemma of having a gifted child who is also learning disabled. Some of the titles are drawn from the Centre for Gifted Education's brochure *Your Gifted Child: A Reading List for Parents* which is available free and which has been distributed as a suggested buying list to all public libraries in Alberta.

Books - General Works

Alberta Education. (1986). *Educating our gifted and talented students in Alberta: A resource manual for teachers*. (ACCESS Network has produced an accompanying six-part videotape series *Serving the Gifted and Talented*.)

This manual, a synthesis of current thought on gifted education, is intended to be a resource for teachers, administrators, trustees and parents in Alberta. It includes a summary of Alberta Education's policy on placement alternatives for children with special needs and excerpts those portions of the Department's *Program Policy Manual* which deal with service to the gifted and talented.

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Davis, Gary A., & Rimm, Sylvia B. (1989). *Education of the Gifted and Talented* (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.

This simply written text is based on current research and will be of value to teachers and parents alike in developing an understanding of the psychology and education of gifted children. It provides one of the clearest and most comprehensive overviews of the subject available at the present time.

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Speed, Fred, & Appleyard, David. (1985). *The Bright and the Gifted.* Toronto: University of Toronto Guidance Centre.

Two Canadian educators provide an overview of the *hows and whys* of contemporary North American education for the intellectually able. Very useful, not only for its Canadian perspective, but because of its clear and realistic explanation of current practices and problems.

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Perino, Sheila, & Joseph. (1981). *Parenting the Gifted: Developing the Promise.* New York: R. R. Bower.

This book is designed to help parents become partners in the educational process, by becoming participants in the identification and development of their gifted child.

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Takacs, C. A. (1986). *Enjoy Your Gifted Child.* Syracuse, NY: Syracuse University Press.

The title expresses Takacs' motivation for writing this guide to the emotional aspects of raising a gifted child. She encourages parents to stop worrying about how well-rounded and "normal" their children are, and to cherish and nurture their individual talents and develop their self-esteem.

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Smith, F. (1986). *Insult to Intelligence: The Bureaucratic Invasion of our Classrooms.* New York: Arbor House.

This stimulating and thought-provoking book does not deal specifically with gifted education, but its title shows its relevance. Smith forcefully contends that drilling, testing and grading on isolated bits of information, which is common practice in schools, has nothing to do with how, or why, children learn.

Books - Topical Works

Preschool Children

Saunders, Jacqueline, & Espeland, Pamela. (1986). *Bringing Out the Best: A Resource Guide for Parents of Young Gifted Children.* Minneapolis, MN: Free Spirit.

A practical resource book for parents of gifted children from two to seven years of age. It deals with commonly-encountered challenges such as coming to terms with giftedness, gifted parenting skills, coping with preschools and schools, and parent burnout.

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Smutney, J. F., Veenker, K., & Veenker, S. (1989). *Your Gifted Child: How to Recognize and Develop the Special Talents in Your Child from Birth to Age Seven.* New York: Facts on File.

The authors incorporate the best child development research with the literature on giftedness to provide parents with the knowledge to identify and nurture their children's gifts and to become more effective advocates with the schools.

Emotional Guidance

Adderholdt-Elliot, Miriam. (1987). *Perfectionism: What's Bad About Being Too Good?* Minneapolis, MN: Free Spirit.

Intended to help gifted and other adolescents avoid the dangers of perfectionism, this book is also useful to parents who want to help their children achieve balance in their lives. The author stresses the difference between the pursuit of excellence and striving to be perfect and offers practical advice on how to "ease up on yourself."

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Webb, James, T., Meckstroth, Elizabeth, & Tolan, Stephanie S. (1982). *Guiding the Gifted Child: A Practical Source for Parents and Teachers.* Columbus, OH:

A psychologist, a counsellor and a novelist address parents' most frequent concerns about the emotional needs of gifted children, including motivation, discipline, stress, depression, sibling and peer relationships and communication. Parents may empathize with Tolan's "open letter" expressing her frustration with the school system over the education of her exceptionally bright son.

Gifted Girls

Kerr, Barbara A. (1987). *Smart Girls, Gifted Women.* Columbus, OH: Ohio Psychology.

This very readable book originated with the author's attempt to understand why her female classmates from a school for high achievers had not fulfilled the promise of their childhood. She looks at the barriers to women's achievement, the conflict between social expectations and personal potential (particularly beginning in adolescence), and gives thoughtful suggestions for parents of gifted girls from preschool through university

Learning Disabled Gifted

Fox, L. H., Brody, L., & Tobin, D. (Eds.). (1983). *Learning-disabled/gifted children: Identification and programming*. Baltimore, MD: University Park Press.

A highly academic collection of articles about a newly recognized group of children, which will inform concerned parents about the areas of research currently under investigation. Nothing of a more popular nature is currently available on this topic.

Reading

Baskin, B. H., & Harris, K. H. (1980). *Books for the Gifted Child*. New York: R. R. Bowker.

The authors, a teacher and a librarian, are committed to the belief that books and reading are of primary importance to the intellectual development of gifted children. They begin with a thoughtful chapter on the intellectual aspects of the reading experience, and then provide an annotated list of 150 contemporary children's books chosen because they are cognitively challenging and ignite the imagination. The books are suitable for children from preschool to grade six.

Underachievement

Rimm, S. B. (1990). *How to Parent So Children Will Learn*. Watertown, WI: Apple.

Rimm expands on the idea expressed in her earlier book, *Underachievement Syndrome: Causes and Cures*, that parents accidently perpetuate underachievement problems by reinforcing nonproductive patterns. She recommends and explains techniques that parents can use to provide a home environment which encourages children's love and respect for learning.

Community Resources

Alberta Associations for Bright Children

This parent organization welcomes as members anyone interested in the education of bright children. By working together, parents can become more effective advocates with the school systems. The local chapters also function as support groups for parents and some offer enrichment programs for children. For more information contact the headquarters at:

Bright Site
11325 - 61 Avenue
Edmonton, AB. T6H 1M3
Telephone: (403) 438-1340

Calgary parents can learn more about the Calgary society, called *Action For Bright Children*, by calling Helen Beach (289-2894) or Rea Gill (243-1132).

ASPEN (Alberta Special Education Network)

ASPEN is a province-wide, computer-based information and communications network which is available free of charge to anyone with access to a personal computer with a modem. Parents with an interest in gifted education can participate in the electronic discussions which occur in the *gifted and talented forum*. For more information and a copy of the user's manual contact:

ASPEN Administrator
Education Response Centre
6240 - 113 Street
Edmonton, AB. T6H 3L2
Telephone: (403) 422-6326

Creative and Talented Studies: An Application of Betts' Model of the Autonomous Learner

Rod Burgess

The Creative and Talented Studies Program was initiated in the Spring of 1986 as a requirement of the Calgary Board of Education's directive that all Calgary Public High Schools offer a program for gifted and talented students. We researched programs that were already in place at other Calgary High Schools, as well as programs in New York, California and Florida. The information gathered indicated that the uniqueness of James Fowler High School (60-40 split non-academic to academic) required a program that would apply and appeal to all our students and not just the top academic ones. Thus, the Creative and Talented Studies Program.

The program was presented to the school's Administration in the Fall Of 1986 and the first students were registered in the course in the 1987 Spring semester.

Dr. George Betts Autonomous Learners Model was used as the basis for the course. This model is geared to students "becoming involved in their own learning with the idea that through this involvement they can become independent, self-directed learners" (Betts 1985). As the overhead shows there are five dimensions to the model - Orientation, Individual Development, Enrichment Activities, Seminars and In-Depth Study. When we look at the timeline that Betts sets out for the program we see that it is planned to run for three years with various dimensions offered for varying lengths of time over that period. Each of the dimens ions has a specific function leading the learner into further independent learning. At the end of three years the student will have not only learned

how to plan and use time, how to develop reasearch techniques, how to develop and complete a project, but also how to use these skills to present the completed work to an appropriate audience and apply the knowledge to future career decisions.

However, all of the above is contingent upon the student choosing appropriate areas of study. Betts talks of "passions" Those things that each of us are truly interested in. It is vital that the student know what his/her passions are. For many students this is the hardest part of the program. Betts allows almost half of the student's time to investigating and arriving at th.at decision.

Unfortunately in the real world of High School we just don't have the amount of time that Dr. Betts proposes. And so, with apologies to George Betts the CATS program has modified the Autonomous Learners Model. At James Fowler we have left out one dimension of the program entirely - Seminars - reduced the scope of two others - Orientation and Enrichment Activities - and placed our main emphasis on Individual Development and In-Depth Study.

The selection process for CATS students is an integral part of the program. James Fowler is a semestered school. This means that students must be chosen in the semester pre ceding the one in which they take the course. Using the Fall semester as an example the school professional staff are approached in mid-October and asked to submit the names of potential candidates for the program.. They are asked to identify students who have demonstrated talents and ability in either a specific course or who have shown all-round ability. This is not restricted to

academic ability. In fact, it is often easier to identify those students who display gifts in artistic and industrial areas.

The Guidance Department is also asked to identify students who have ach ieved high academic scores at Fowler or in their feeder JUnior Highs. Once these students have beeu named the teacher submitting the name is asked to complete an anecdotal report and a checklist on the student. These give a generalized overview of the student's ability and apparent talents and interests.

The students are in vited to attend an explanatory meeting. During this time a cour se description is presented to them and an expanation is given as to why they were invited. They are requested to fill in a self-evaluation instrument measuring their perception of their abilities and creativity. They are also asked to have their parents fill in a similar instrument about them. Originally, during the first two semesters the course was offered, parents were invited to an orientation meeting, but this proved very time consuming. Finding an acceptable time and having to follow up or track downwho did not attend proved onerous and not particularly productive. During the last three semesters the nature of the program has been exp lained and promoted through the Guidance Department, brochures and visits to Junior High Schools.

Once all the documantation is collected a decision is made by the instructor, in consultation with Guidance, as to the acceptability of the student. In rcent semesters the numbers of students has risen to twenty and if it goes higher we will

be forced to place a limit on the number of students accepted into the course.

Once a student is accepted Guidance rearranges the student's timetable, if necessary, for the next semester. CATS is always offered in the last period of the day and this may mean a student must drop another course or change the order of his/her courses. CATS is considered to be a Special Projects course by the Department of Education and carries a five credit value.

The course begins with students examining their own needs and goals. They are asked to assess their uniqueness, their maturity, their work and study habits and their areas of interest in and out of school. All this material is confidential to the student. Phase Two begins with a series of activities intended to improve their work and study habits. Methods such as SQ3R, SO RF, Summary and Notetaking are examined. Several short assignments intended to introduce them to the facilities in the school Library are carried out. Also, during this Phase they are asked to start to display their creative abilities. They take the NASA Moon Test and must do at least one short term preparation creative presentation to the class.

Finally, they are introduced to De Bono's CORT Thinking program with emphasis on the section on creativity.

The Third Phase involves understanding and developing interpersonal skills. The students take the Gregoric Personality Inventory and several instruments to measure learning styles.

The time frame for completing all these activities is approximately three weeks. During this time they are asked to consider possible projects with timelines of six to seven weeks.

At the end of the third week the students complete Betts' In-Depth Study Contract form. This requires them to define their project, their rationale for the project, their objectives and to give a detailed plan of what they will do to accomplish their project. This is discussed with the instructor and adjustments are made, if necessary. A regularly scheduled meeting time is set for the instructor and student to meet to discuss the student's progress. Students must complete a weekly plan and maintain a daily diary.

In many cases the students are paired with a mentor. This is usually a teacher in the school, but on occasion, students have paired with people from the business community, the University, service clubs and other schools.

What kind of projects do they choose? CATS offers an opportunity to go beyond the regular High School curricula. While many projects are linked to courses offered in the syllabus - music, art, wood work, drama, biology - many others transcend the curricula - parachuting, taxidermy, working with the deaf, ventriloquism, Indian lore and heritage and architecture.

If the Department of Education allowed it this course would be on a pass-fail basis. This is not permitted so we have arbitrarily set 75% as the lowest grade achievable (with the exception of failures). It is not the intention of a course like CATS to measure the creativity and talent of the students enrolled. Instead, this course is meant to start their creative juices flowing. How can you compare a project in computer animation with one in hydroponic farming? I can't. But to comply with

Department of Education regulations we must give a grade to each student. To do this we measure, rather subjectively, the time and effort that has gone into each project in terms of research, preparation for presentation, the quality of their daily diaries and finally their presentation to the class. This last aspect also measures their interpersonal skills in the areas of speaking ability and question and answer techniques.

One of the expressed purposes of this course is to help students develop better learning techniques and to be able to transfer this to subsequent courses. The data collected does not indicate that there is a marked improvement in the cognitive area. Most students' G.P.A.'s remain constant over their three years of High School regardless of when they take the CATS course. However, there could very well be improvement in the affective areas. Many students have stated that CATS has given them a more positive attitude towards school and made them more inquisitive. In at least three cases - drama, art and working with the deaf- students have gone on to further studies that they would not have considered without being introduced to these ares in the CATS course. So, is there future success in other courses because of this course? No, if you only examine G.P.A.'s. Yes, if you look at the broadening interests the students have developed.

The Calgary Public High School system is a bit of a dog eat dog world when it comes to attracting the academically gifted and creatively talented. The introduction of the International Baccalaureate program approximately ten years ago made two of our schools the "shining lights" in the System. With the ending

of school boundaries the top academic students were quickly drawn to these schools. This meant an apparent downgrading of other schools academically. The answer was to try to attract students with specialized programming. Some schools promoted athletics, others fine arts and ours used its vast array of industrial arts courses. But these were not enough. You must appeal to all students and thus, you need a broad based program. CATS is but one facet of this. However, its uniqueness appeals to both academic and non-academic students. It says, "James Fowler is a school where you can fulfill all of your curriculum requirements and still have the opportunity to experiment - to stretch your imagination and test your creativity". Like a glossy advertisement it says, " Come to Fowler where you can try something new - something that no other school can offer you".

Finally, NO! This is not a program for all students. Those who need close supervision, those who lack self-motivation and hard core concrete sequentials will not be very successful. Every semester one or two students are invited into the program and it is a misplacement for them. Some refuse to do the work, some become extremely frustrated and others leave unfulfilled. When we see one of these students we attempt to counsell them out as quickly as possible and place them in another course. On occasion students fail because of their inability to cope and our inability to see it in time. But, our overall success rate is phenomenal. As a student said a year ago, "Before I took CATS I knew I was going to University. Now I know what I want to take when I get there." She is presently registered at U. of C. in the pre-Education program because she is going to teach deaf children in five years.

A Strong Case for School Subject Tests as Identification and Planning Instruments

Alan L. Edmunds

INTRODUCTION

The last three decades have seen IQ tests and other sundry instruments dominate the identification and curriculum planning processes of gifted education. This results in little correspondence between the way in which giftedness is defined and the way in which gifted education is programmed. On one hand, students are identified by IQ scores, yet on the other, they are placed in a gifted program that emphasizes math, science, social studies and other such specific subjects because this is what school is all about. The operational constructs of the identification instruments have little implication for programs that teach school subjects. Hitchfield (1973) stated that the probability of predicting high achievement " in a number of different school subjects . . . from IQ . . . was very small indeed (p.34)." If educators want to successfully predict achievement in a number of different school subjects, school subject tests must be used.

Differentiated Curriculum

In many ways, curricula are not meeting the educational needs of the gifted. Kaplan (1989) discussed many aspects of gifted curricula and concluded that differentiated curricula must derive its tenets from the primary objectives of the regular curriculum. A curriculum model based on school subject tests and school subject curriculum would fit that requirement. The fact that this is what is used in schools illustrates that it has been adequately researched and has proven effective in teaching the gifted. This model would be developmentally appropriate for each student in each subject area because the assessment criteria would be relevant to the material being taught. The ultimate test of a curricular model would be its addressment of the following questions:

1) Is the curriculum differentiated for the gifted?
2) Is the curriculum appropriate for the gifted? (Kaplan, 1986, p.129)

Curriculum based on and programmed from school subject tests would be differentiated and appropriate for the gifted. An example is a grade four student completing grade eight science because it is suited to the skills and mastery of the child. It is differentiated because it is not appropriate curriculum for regular grade four students and it is appropriate because it addresses the individual needs of the gifted student in science.

Another area of support comes from the two major curriculum models in gifted education. They are either general in nature and advocate enrichment, or they are specifically focussed and advocate acceleration. It is obvious that the adoption of one calls for the exclusion of the other and, as has been noted by numerous researchers, this either/or scenario has not addressed all of the educational needs of the gifted. A blend of the two is needed but it appears that a many such approaches are being useed without strong research evidence (Shore,1989), hence, are without value to the education of the gifted. Van Tassel-Baska (1986) likened these approaches to a recipe.

> Throw together a special unit on the latest topic of interest in the larger socio-cultural context, add creative problem-solving, mix with higher level thinking skills, and stir in a special research project until done (p.164).

Given this, educators are no further ahead than when they were arguing the enrichment/acceleration issue. What needs to be put in place is a curriculum model that can be translated into an implementation and research base where its effectiveness can be continually tested and assessed. School subject testing and use for planning education programs meets this need.

Effective Teaching Practice

The advocacy of gifted education cannot be taken for granted and the best advocate is effective teaching practices. The proven curriculum practices of school are the subjects of math, science, social studies and others. Shore (1989) examined whether the professional literature supported the many theory-driven practices being used in gifted education. He reported that numerous theory-driven program practices were not substantiated, hence, should not be practiced. Instead of letting quasi-proven theories of gifted education drive curriculum practices, educators should make proven curriculum practices drive gifted education, the proven practices of school subject teaching.

Developmental Appropriateness

Developmentally, it would be in the best interests of gifted students to use school subject tests for identification and program planning. Feldman's (1986) developmental framework provides a mechanism for such an examination.

> First, developmentalists tend to emphasize processes of intellectual functioning, rather than underlying traits of various kinds and sizes. Second, developmentalists chart sequences of stages or levels of mastery in preference to attempting the measurement of general ability. Finally, stage developmentalists in particular have recently begun to see giftedness as domain-specific (Feldman, 1986; p. 286-287).

When this perspective is applied to school subjects, the result is, school subjects that develop intellectual processes, are developmentally appropriate across a continuum of levels of mastery (grades), and are domain specific, as in math, science, social studies.

The essence of gifted education is the particular attention paid to the individualization of educational programs. Instead of having a "gifted program", schools should have individualized programs for each gifted child based on abilities in the various school subjects. This individual development focus would not only address how gifted children differ from each other in each school subject, but also, how gifted children differ within themselves in each subject. To appropriately place students in each subject, school subject tests must be used. Any child who has mastered the curriculum beyond grade level is "intellectually underserved" (Keating, 1989). One can only imagine the boredom and frustration of a grade four student who is ready for grade seven curriculum, yet has to endure three more years of instruction on material that is already mastered.

Cognitive Differences

Cognitive level is viewed by many (Shore, Hymovitch and Lajoie, 1982; Brown and Yakimowski, 1985) as the factor that differentiates the gifted from the non-gifted. Cognition research seeks to answer questions by examining or reexamining the results of psychometric studies, primarily the construct of intelligence. According to Shore (1986), cognition is not a precise term.

> It includes performance in thinking, learning, memory, cognitive styles, problem solving, and similar activities. There are fuzzy boundaries between these

> processes and between cognition and other processes in the affective or other domains; these boundaries should probably be regarded as defining focus, not exclusive territory (p.24).

None of the above mental activities act in isolation, rather, they act in a multidimensionality of unisons. How, then, can educators ascribe to determining differences between these "fuzzy" constructs with any hope of making them applicable to the schooling of the gifted?

A more educational view of cognitive differences is the developmental concept of "decalage" offered by Piaget (discussed in Cowan, 1978). Decalage refers to the nonparallel cognitive development that occurs relative to the different domains of learning. Piaget discussed horizontal decalage as nonparallel stage development across different domains while vertical decalage referred to nonparallel development that occurs among or over stages within a domain. In simple terms, this means that a student may be better in math than in language arts and may be better in geometry than algebra within the rubric of math. A school subject assessment battery to determine decalage in each subject area would identify the strengths and weaknesses of all students, removing the "elitism" label attached to many gifted programs. There would not be gifted and non-gifted students, just students with varying abilities in school subjects. It would have much more appeal for parents, teachers and administrators alike. Another benefit would be a contribution toward diminishing of the myth of the "well-rounded" gifted child. Currently, identification and entry into a gifted program comes with this kind of baggage. Alternatively, a school subject assessment and programming base would clearly outline the strengths and weaknesses of each student and not hint that the gifted student should be outstanding in all school areas. Also, school would no longer be out of step with other parts of the lives of the gifted. School would now closely match the continuum of life which demands preparation for all of life.

CONCLUSION

The evolution of effective curriculum and instruction for the gifted has reached a stage where uncertainty reigns and the gifted are not being as well served as is possible. This is primarily due to the domination of IQ and other such tests for the identification and program planning of the gifted. This is the classic case of the unproven research driving the practice of gifted education. There is a definite mismatch between that which these tests measure and that which the school

curriculum offers to the gifted student. Educators must realign the identification and planning criteria with the school curriculum. This can be accomplished through the use of school subject tests. It is a classic situation wherein proven practice could very well drive the practice of gifted education. Once the use of school subject tests is acknowledged as a viable model for gifted education, all of the other aspects of gifted education can be assessed from this established and proven base of curriculum practice. If not, the uncertainty, recipes and possible disservice will continue.

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Shore, B. M. (1989). Building a Solid Professional Knowledge Base. Lecture presented at the Alberta Colloquium on Giftedness, University of Alberta. Edmonton, Alberta: November 22, 1989.

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Shore, B. M., Hymovitch, J. and Lajoie, S. (1982). Processing differences in relations between ability and field dependence. *Psychological Reports*, 50, 381-395.

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Teaching Thinking: Enhancing Learning
Alberta Education's Principles and Guidelines for Teaching Thinking

Alan L. Edmunds

Alberta Education's Secondary Education Policy (1985) and Education Program Continuity Policy, ECS to Grade 6, (1988) emphasized the importance of teaching students to think, solve problems and make good choices.

Principles and guidelines for teaching thinking, ECS to Grade 12, have been developed and published in a new resource document, TEACHING THINKING: ENHANCING LEARNING (Alberta Education, 1990).

In this teaching resource we offer a definition of thinking, describe nine basic principles on which our suggested practices are based, and discuss possible procedures for implementation in schools and classrooms.

"Thinking . . . . the mental processes and skills we use to shape our lives."

GUIDING PRINCIPLES

Nine guiding principles provide a starting point from which all educators can explore ways to enhance the explicit teaching of thinking.

- Students can improve their thinking skills.
- Students should have opportunities to improve their thinking skills.
- Educators should instruct students in thinking skills.
- Educators should use a range of strategies in teaching thinking skills.
- Educators should make use of life experiences and school subjects in teaching thinking skills.
- Educators should have opportunities to learn about thinking as well as how to teach thinking.
- Educators should use appropriate evaluation techniques to assess thinking skills.
- Administrators can and should ensure positive attitudes toward thinking in schools.
- Alberta Education should make explicit the teaching of thinking in curricular documents.

43

These principles, though possibly appearing like motherhood statements, do provide a philosophical base for programming. As well as outlining the roles of various participants, they also indicate some basic positions such as: thinking skills should be explicitly taught but integrated into existing subjects and courses, and no particular programs for teaching thinking are advocated by Alberta Education, but an approach and program that best meets the needs of each school community. This also acknowledges the good and varied programming for thinking going on in many Alberta schools.

The new resource book has suggestions for teachers and schools wanting to develop and implement school and classroom programming. School communities should:

- explore the teaching of thinking through a review of the literature and other professional development activities
- create a feasible local approach to the teaching of thinking
- make decisions regarding specific teaching thinking procedures in their school, and
- implement the selected approach.

Skillful thinkers exhibit certain attitudes. We identify four prevalent dispositions that thinkers can experience. These dispositions exemplify thinking and life goals for all learners.

Thinkers are. . . . DISCOVERERS
CREATORS
EVALUATORS
PERFORMERS. . . .

Discoverers search for new information, experiences and feelings; creators experiment with a variety of approaches, transforming ideas in their own way; evaluators analyze risks, test assumptions, follow their intuition, weigh evidence and make decisions; performers take ideas into action, overcoming obstacles and achieving their goals.

The overall goal of teaching thinking is to develop autonomous learners. This is a marked change from being a directed or reproductive learner and it implies changes in the traditional roles of student and teacher. Some characteristics of the old and new roles are described in the tables below.

44

Table 1

CHANGING ROLE OF STUDENT

REPRODUCTIVE THINKER	AUTONOMOUS THINKER
• reproducing knowledge	• creating and discovering knowledge
• passive recipient	• active decision maker
• convergent, rule abiding	• divergent, steps outside of rules to create original ideas
• information narrowly focussed	• information broadly focussed and interrelated
• one right answer	• multiple solutions
• mistakes are flaws	• mistakes are learning devices
• external evaluation and direction	• self-evaluation, self-direction
• individualistic, competitive	• collaborative

Table 2

CHANGING ROLE OF TEACHER

DIRECTIVE THINKING	FACILITATIVE THINKING
• provision of knowledge	• construction of knowledge
• disseminator	• mediator, collaborator
• content focus	• process focus
• information narrowly focussed	• information broadly focussed and interrelated
• general student assessment based on common standards	• assessment of student as an individual learner
• common instruction	• accommodation of learner differences

45

For building thinking skills in classrooms many examples and activities are suggested for teachers. Here's an example on visualizing.

Definition: Visualizing is the constructing of mental images, sensory impressions, emotions or verbal linkages about a focus of thought.

Skill Attributes: Visualizing involves the creating of mental pictures related to information and projecting physical sensations or emotions to an idea, topic or theme. It can include a mental linking or a mental discussion about the information in the form of dialogue, story or action. This ability to link and create meaning is a powerful tool in concept development, comprehension and information retention.

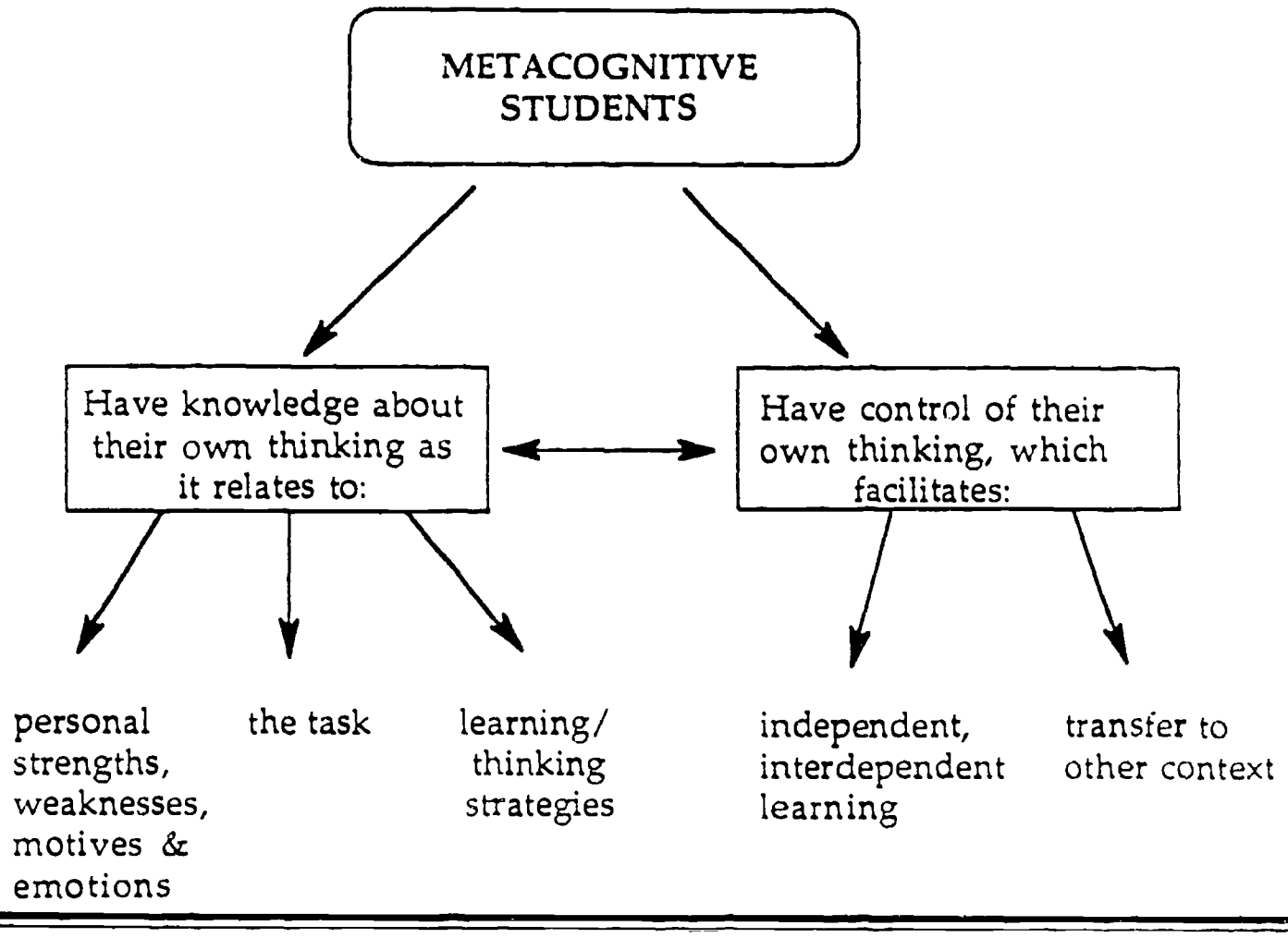
Direct Teaching: This skill involves guides direction in forming, recallin , discussing the formation of mental images, sensory impressions, emotions and verbal linkages. Create a mental picture of information you are trying to process, put the information into words or talk to yourself about the information. Create sensory impressions, symbols or emotions related to an idea. Put into words the sensation and emotion. Visualizing can highlight information just learned, assist in retrieving information and stimulate the restructuring and creation of new ideas.

Application:

- Creating images related to concept. Expand images as new information is gained.
- A teacher may direct the image formation while students, closing their eyes, form their own picture, e.g. a buffalo hunt on the prairies. "The warm sun is beating on your back while you crouch down behind a rock among the bushes. You peer over to view the herd of buffalo and observe another hunter approaching. You move in the crouched position, adjusting the buffalo skin over your body. You test the wind with a damp finger. You adjust your direction." Students can continue the image formation, discuss their images and recreate the image by drawing or role playing. Factual information is more easily remembered in the context of a meaningful story that links historical information with a learner's present experience.

- Imagine a process before setting out to do it. The process and steps of locating information in the library or conducting a science experiment can be visualized. The process of creating direction for actual activities. Anticipated results can be compared with actual results.
- Form images for sensory impressions and emotions related to story students are about to read. Discuss impressions, predicted relationships and then compare impressions with actual reading.
- Visualize topic or theme before creative writing.
- Visualize gymnastic movements or routines before performing them.
- The sketching of mental images is a powerful thinking tool. Differentiate between drawing (use of much detail) and sketching (using as few lines as possible to create an image). Images first and foremost must be meaningful to the creator as they often retrieve past experience. Sharing in a supportive manner can expand awareness of concept attributes.

Metacognition, thinking about your thinking, is emphasized as crucial to the development of all thought processes. This figure shows the variables involved in metacognition.



47

Transfer of skills, moving beyond the lesson to use of skills in a new context, is also stressed. The attributes of the skill must be transferred to the new context with the help of the teacher who can guide the student to abstract the rules or framework used in the initial learning to the new situation.

Evaluating thinking must involve evaluation of a school's or classroom's programming for thinking as well as assessing growth in students' thinking. Of course, growth in teacher thinking is also an important consideration. Several instruments are provided to assist in these evaluation processes, but teachers and schools are encouraged to design their own also. Below is an example of one of the evaluation forms suggested.

Rate Your Thinking

Check items in each of the role areas, then cumulatively rate each one on a 1-5 scale.

Rate Your Discoverer 1 2 3 4 5 (low ... high)

[ ] I am alert and observant.
[ ] I gather information using all my senses.
[ ] I look beyond the information presented.
[ ] I look for information in many and unusual places and sources.
[ ] I brainstorm possibilities and keep adding new ideas.

Rate Your Creator 1 2 3 4 5 (low ... high)

[ ] I look at information from many perspectives and points of view.
[ ] I combine information in novel and unusual ways.
[ ] I embellish ideas to create meaning and interest.
[ ] I visualize new combinations and patterns of ideas.
[ ] I can put ideas on the back burner and let them simmer for a while.
[ ] I can see humour in my ideas, follow intuition and feelings.

Rate Your Evaluator 1 2 3 4 5 (low ... high)

[ ] I evaluate with criteria.
[ ] I recognize assumptions, fallacies and bias.
[ ] . make predictions, examine drawbacks.
[ ] I step outside my feelings.
[ ] I assess from others' points of view.

Rate Your Performer 1 2 3 4 5 (low ... high)

[ ] I profit from criticism and error.
[ ] I forge ahead persistently.
[ ] I seek challenge and take risks.
[ ] I have multiple solutions to problems.
[ ] I create opportunities for others.
[ ] I capitalize on resources around me.
[ ] I follow through on tasks.
[ ] I bridge gaps in problems.

"Teaching Thinking: Enhancing Learning" & "Focus on Research": Their Place in Gifted Education

In the past, many of the thinking skills that learners acquired were by osmosis. In effect, you either picked them up from teachers, parents or others, or you did not. It is obvious that this is an inefficient way of distributing the information and thinking skills that teachers have acquired and want to pass on. The *Nation at Risk* report by the National Commission on Excellence in Education (1983) recommended that thinking skills be taught in the school. Since that time, many writers/teachers in the area of gifted educaytion have espoused the need for, and benefit of, the explicit teaching of thinking and research skills to the gifted.

Gifted students, as other students, can derive great benefit from the explicit teaching of thinking skills. This is not surpnsing given that many gifted students usually possess superior cognitive processes. For this reason, Teaching Thinking: Enhancing Learning and Focus on Research have a lot to offer teachers who decide to include the teaching of thinking in their curriculum for gifted children. They provide teaching methods and materials that explain the skills, how to implement them, and where to find support resources for their inclusion in every-day curriculum.

The primary links to gifted education for the above documents are below.

Teaching Thinking: Enhancing Learning	Focus on Research
• strengthen intellectual abilities through practice/exercise.	• independent study is invariably included in gifted education
• help students learn conscious and deliberate strategies for reasoning, problem solving and critical thinking.	• research skills are prerequisites for discovery and autonomous learning
• increase students' understanding of their own and others' thinking	

49

Using Art as a Means of Identifying Gifted Children

Janet Evans

A society designates as *"gifted"* an individual who embodies those characteristics most valued by the culture in which he lives. In North American society we may talk of gifted athletes, or gifted artists or performers, but most often the term applies to those who possess general intellectual ability. In our elementary school system, with its emphasis on written and oral communication, the bright but non-verbal child is often overlooked. It is relatively easy to target the child who enters grade one reading at a grade five level, or one who is able to express thoughts and ideas and to demonstrate his curiosity about his world in articulate, well-thought-out sentences. These are the children most usually considered for enrichment programs as it is difficult to discover potential in a child who does not express his ideas through language. Children who are particularly hard to identify include those in the following categories:

- those who experience socio-economic deprivation
- those for whom English is a second language
- those who are not in the cultural main stream
- those who are learning disabled
- those who have experienced emotional or behavioral difficulties.

All too often, unfortunately, children in our high-needs schools may experience several or all of the factors on the list and thus may gain little success at school, particularly if viewed in the traditional way. All too often, little is expected of these children, and, as a result, they live up to expectations.

In order to be identified as gifted, and then to be exposed to programming that will nurture and challenge, a child must be given an opportunity to demonstrate his giftedness. The universal,

non-verbal language of art is one way of providing such an opportunity, as art is truly a universal language. The exuberant kinesthetic movements of the toddler's scribble stage and the ubiquitous blue clouds of the primary school child are found from Nepal to Mexico. The emerging schema which becomes steadily more complex provides tangible clues to the child's emergent thinking processes. Because the language of art is both universal and developmental, it serves as an excellent vehicle to reveal ideas that cannot, for whatever reason, be communicated through more conventional language forms. Psychologists have made use of such tests as the Goodenough *Draw-A-Person* test as one indicator of intellectual development while Edward DeBono used children's drawings as the vehicle by which they could express complexity of thought and ability to problem solve.

In looking at children's art work with the idea of ascertaining level of intellectual development, it is essential to be aware of artistic and visual stages as the child makes the journey from random scribble to the development of an organized symbolic language which can communicate ideas and demonstrate thought processes and problem solving skills. It is essential as well to consider a wide selection of works in varying media for even the most tentative conclusions to have validity. Just as spoken and written language consists of different vocabularies used in formal and informal situations, so does the rich varied symbol system of visual language. With these cautions in mind, we can then apply some of the same criteria to visual products as has been traditionally used in the verbal area. For example, memory, the ability to store and access information as well as to generalize and organize information can be depicted visually. Through art, we can identify the alert observer, the child who responds with sensitivity to the stimuli of his environment. Productivity, the generation and execution of many ideas is often an indicator, as is the ability to become absorbed in the task for a long period of time. Mastery of materials, dexterity, speed and skill are other qualities to consider. Some other indicators of giftedness-

risk taking, a rich fantasy life and creative viewpoint may not be evident in the work of these hard to identify children. It takes a great deal of self-confidence and a secure sense of belonging in order to dare to be different, to take intellectual risks and to play with ideas. Many of these children come from cultures where it is not considered proper for a child to question and challenge. Many of these children, in an attempt not to be different, seek the anonymity of the ordinary, or the acceptance and accolades that are accorded those classroom artists who can accurately portray a *Simpson* or a *Garfield.* A sense of humor and wit can often be found in the drawings of these children. The ability to elaborate and to simplify, reducing ideas to their essence are techniques to watch for.

All in all, there is much to see and to discover if we can learn to look. Not all gifts can be measured with a WISC-R. Lives of both teachers and children are enriched when hidden potential is discovered and challenged.

Distance Education in Alberta

Tom Gee

Distance Education: *what it is*

To provide a funding and monitoring framework for the distance education program, Alberta Education uses the following definition:

Distance education is defined as the use of any appropriate means to eliminate distance between student and teacher in order to enable the school to provide courses not otherwise available from a teacher locally by traditional delivery methods due to a) insufficient student numbers in these courses, or b) absence of an on-site specialist to deliver these courses.

The distance education classroom may have anywhere from two or three to 10 or 12 courses underway at one time. An in-school distance learning coordinator and distant tutor/markers combine to provide students with an opportunity to take these courses that otherwise would not be available.

Eighty-five per cent of the distance learning materials used in Alberta are used in small rural high schools. The acceptance of distance education may be measured in the three-fold increase of participating schools in the first three years of the program.

Distance Education: *the why and the how*

Alberta is characterized by wide open spaces, long distances and a sparse rural population. In most of rural Alberta, students are bused to centralized schools. Sometimes these have small high school components. Sometimes these schools are located outside the students' own communities. Sometimes the bus rides are very long.

Maintenance of the local high school, with a full educational program, is essential if *equitable educational opportunity* for all students is to be achieved.

Distance education takes the content expert to the student. It combines the traditional teacher-student relationship, the flexibility and variety of correspondence courses, and the delivery technology of telecommunications. Distance education gives students the benefit of increased course selection. Courses unavailable in a conventional setting are taught by subject specialists from a distance.

Students remain in their own local school. They're assisted by a classroom teacher and they receive their teacher guidance from a subject specialist. The subject specialist may be in the students' school, a different school, the community, Alberta Correspondence School or on a farm many kilometers away. The subject specialist may work from home or office.

Students access information, materials and resources by mail, telephone, computer, facsimile machine, teleconference convenor, satellite receiver, or by video and audio cassette players. Telephones, fax machines and computers give students quick response and evaluation of completed assignments.

Producing the Goods

Alberta Education is dedicated to providing all students with equitable access to quality education. When required materials are not commercially available through publishers and other suppliers, they are created for the courses. Most distance education materials are designed and printed at the Alberta Correspondence School. All materials, either acquired or produced, are then supplied to Alberta schools through the Learning Resources Distributing Centre. A full catalog of all materials is provided to each school in Alberta.

A brief history of Distance Education in Alberta

In September 1987, 13 high schools in 10 school systems in southeastern Alberta began offering distance education in what was called the Distance Learning in Small Schools Project. In the first semester, 60 courses were offered to 347 students. An additional eight courses and 239 students were added in the second semester.

In September 1988, Project North added schools from 12 school systems in northwestern Alberta, and another 15 schools were added in the south. Students taking courses by distance education increased to more than 1,100.

The Alberta Government established a Distance Education Equity Grant in 1989 to make possible the acquisition of distance education equipment and staff in small rural high schools throughout Alberta. Early indicators showed that distance education was cost-effective, and that student results were competitive with those from traditional instruction.

By September 1989, distance education was no longer offered on a project basis. It had become part of the way rural high school students receive their education in Alberta. Over 130 schools were participating. They all had fewer than 150 high school students and almost all were located in rural Alberta.

The Tools of Technology in Distance Education

Technology is vital to distance education. Traditionally, correspondence courses by mail have had a 30% completion rate by students. With distance education, the completion rate is 90%. Technology contributes to this dramatic increase by putting the student in closer contact with the specialist teacher and providing a faster turnaround on assignments, usually less than two days.

Facsimile machines transmit assignments from student to subject specialist and back. Teleconferencing provides live oral instruction in language study and other courses. Satellite dishes increase the range of television programming available. Computer managed learning (CML) provides immediate generation of tests and feedback on answers. Computer assisted instruction (CAI) is on the horizon.

The Alberta Special Education Network (ASPEN) is a toll-free computer telecommunications service which includes a distance education conferencing network among its many services. These range from electronic mail to subject area forums to student conferencing.

Combined with conventional print materials, technology will continue to grow in importance in the delivery of distance education programs.

Distance Education: *the goals*

- Enhanced opportunities for learning with more courses and broader choice of subjects
- Better designed learning resources using print and non-print media.
- Personalized instruction and continuous progress in multi-grade and multi-program settings
- Improved on-site learning centres.
- Use of communications technology to deliver courses and materials.
- Shared educational resources among districts and local or regional consortia.
- Partnerships among public and private sector participants to develop and deliver "the best possible education to Alberta students, regardless of where they live."

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Alberta
EDUCATION

To Be Successful It Must Be Invisible

Don Green

The title itself would seem to be a contradiction in terms. If we were to take the advice of the great masters and blend them together so that we might select those components that support a very natural approach to learning, we could in fact, make some interesting decisions about Education. A blended approach to programming, which attempts to develop the individual student's abilities as well as create academic risk takers, is one that blends all of the great ideas of the master teachers both past and present.

A survey of the literature is likely to bring out three major statements which might guide our thinking as we make our programming decisions. The first one would be; The quest, it seems, is to devise strategies and materials that will challenge the superior student while not destroying the confidence and will-to-learn of those who are less able. Secondly; when curricula, classrooms and examinations stress only limited methods of looking at problems and limited ways of thinking about them, creative adaptation of learning is reduced, and the functioning of intelligence is blocked. Thirdly; when teachers can formulate open-ended learning tasks capable of being handled on several levels and can compose small groups by following the lines of relationships and communications among the members, heterogeneity becomes an asset rather than a handicap.

When considering the above statements it becomes apparent that a combination of Dr. Donald Treffinger, Dr. Calvin Taylor, Dr. George Betts, and Dr. Joseph Renzulli would provide a way of programming such that the needs of all students would be met. A philosophy is necessary which does not allow for the labelling or segregation of students who are different from the so-called normal - whatever normal is. Gifted kids are not just gifted at two o'clock on Thursday for 40 minutes nor do they just become gifted when they go into grade four. They require the sum of all the services that are provided to meet the needs of students all day, every day. Programming for the gifted must involve special services, alternative activities as well as the services in the regular educational program.

The teacher who uses Blooms Taxonomy to assist in differentiating activities for students, who uses good questioning techniques and who provides a positive nurturing environment will, in fact, be meeting the needs of all students, including the more able. A philosophical base which recognizes that all learners have unique abilities, interests, and needs that require a systematic and continuous evaluation of skills and knowledge will promote the concept of blendedness. A school staff that supports the assumption that if a differentiated program based on Bloom's Taxonomy is good for gifted students, it is good for all students, will bring about invisibleness.

Students learn very quickly that it is safe to try difficult and unknown tasks without fear of failure. The development of students who are academic risk takers is of paramount importance for the success of society and its values.

Teachers must be risk takers, have a positive attitude towards students, peers and the teaching profession. They must be well-organized, know their curriculum areas, encourage student movement, strive for on task behavior and be committed to the concept that students can and must make decisions about their own education, beginning in grade one.

If we differentiate the instruction and practice given to students; if we provide a nurturing environment in which students feel they are important to the system; if we maximize opportunities which will allow for an increase in the development of individual student strengths in the academic, creative, planning, communicating, forecasting, decision-making and leadership areas; if we maximize opportunities which will allow information and activities to have more personal meaning for students, we will have a blended program which will meet the needs of all students, including the gifted, and therefore be invisible.

Mini-University: Energizing Potential via Practical "Hands-On" Experience!

Aurora Hamilton

OVERVIEW

Mini-University is a unique, fun-filled, educational program that provides children, aged 10-15 years, practical "hands-on" experience in a variety of subject areas, exposure to potential career avenues, and a taste of University life. The program emphasizes creativity and personal development and enrichment.

Mini-University is run in conjunction with an average of twenty (20) University of Calgary faculties and departments per year. The instructors are selected graduate and senior undergraduate students chosen for their ability to transform concepts and ideas into creative laboratory experiences that are fun and educational. All instructors work under the direction of a faculty advisor and the detailed curriculum is developed to accommodate age and educational levels of the participants.

Participants are grouped according to their age and grade. The low instructor:participant ratio enables participants to take the experiments/activities to their level. Daily, from 9 am to 5 pm, participants experience and experiment in up to five(5) different disciplines. There are two supervised recreational periods each day; one at noon and the other at 3 pm, when participants are able to participate in a variety of lifetime leisure pursuits. Small groups ensure opportunities for social interaction as well as intellectual development.

Mini-University provides this sometimes difficult age group with the unique opportunity to become involved with their personal growth and development in a comfortable, non-threatening environment. The goal of the program is to provide participants with the opportunity to grow and mature at the intellectual, social and emotional level and to develop lifetime leisure skills.

The program operates in the outstanding facilities at the University of Calgary. Participants are exposed to the university labs, equipment and have the opportunity to actually use the equipment in experiments and activities that before were inaccessible or unknown to them.

Mini-University has been operating since 1983 at the University of Calgary, as Campus Recreation program. The program has grown from two (2) modules to four (4) "liberal arts" and two (2) "specialty modules: science and art/drama , and participant numbers have grown from 200 to almost 1200 per year. There has been a fairly equitable split between male and female participants overall in the program, however, the male/female ratio in the specialty modules currently supports the thesis that science is still dominated by males and that art/drama is a female domain.

THE CURRICULUM

The Mini-University curriculum is updated, amended, changed on a yearly basis and reflects the strengths and expertise of the instructors. The curriculum is designed so that the emphasis is on activity rather than lectures. (This IS summer vacation!!) The program runs for two weeks and participants receive an average of 9-10 hours of acitivity in each discipline. The 1990 Mini-University curriculum included the following activities:

Law: Charter of Rights/Young Offender Act/making a will/developing laws for an island community

Social Work: looking at cultures/working with clients/role play

Environmental Design: environmental Science/solar cooking/recycling paper process/industrial design

Physical Education: Sport administration/adapted PE/athletic therapy

Creative English: Shakespeare in advertising/commercials.comic strip writing/poetry

Computer Science: developing a personal data base/building a resume/MAC functions beyond basics

Sociology: methods:surveys/studying societal differences,simiiarities

Biology: photosynthesis/using the microscope/heredity/genetics

Health Science: preventive medicine/scientific basis of training and conditioning/joint care/circulatory and visionary systems (dissection)

Art: clay work/t-shirt screening/charcoal art/india ink sketches

Education: communication methods/listening skills/logic/micro- and peer teaching

Biochemistry: discovering the "caramilk secret"/fabric dyeing process

Management: labour negotiations,marketing a new product

Psychology: sensation/perception/associations/stress management/memory/conditioning experiments

Engineering: surveying/straw structures/suspension bridges

Anthropology: cultures/traditions/archeological dig

Drama: mask-making/improvisation/self-expression

Mini-University was developed to encourage the public use of the University of Calgary facilities and expertise and to provide the opportunity for children to learn and grow.

"Two weeks in Mini-University is guaranteed to teach you more than two months in school,but it teaches it in a fun, and interesting way. For example have you learned about the human eye by doing a hands-on dissection of a cow's eye, or played games and did position puzzles to learn about non-verbal communication? That's what i mean by a really different way of learning." Ardith Baerveldt , age 14 MU C3

Teacher Evaluation of Students Placed In Screening Programmes for Giftedness

Georgean Harper / Margaret Winzer

Preliminary results from a pilot project involving joint endeavours of personnel from the University of Lethbridge and Lethbridge School District #51 are presented in this paper. The purpose of the research was the Identification of gifted and talented children while eliminating costly individual and group achievement and cognitive testing procedures that have been traditionally used.

The Identification Project involved three components: newly designed Rating Scales, tests of achievement and language ability, and teacher evaluation of the students placed in a gifted and talented programme. The emphasis in this paper is on the teacher evaluation of the students while they were working in class.

The procedure involved collating Rating Scales given to Teachers, Parents, Peers, and the Students. The categories of questions involved Language Competence (L), Academic Competence (A), Task Commitment (T), Creativity (C), and Social/Emotional Development (S). The Measurement tools consisted of achivement and language results, individual I.Q. results, and interest inventories. The third component, designated as "Curriculum Based Assessment", consisted of teacher evluation of the students working in-class. All data was statistically analyzed.

Method involved a Ten Week Unit of study designed to evaluate students in their academic abilities in mathematics (A), and language (L). These results of a curriculum based nature were combined with a "check list analysis" per lesson of the students' (T), (C), and (S). Thus this "curriculum based assessment" (C.B.A.) of Lesson Ratings evaluated the following:

a) Introduction to the theoretical concepts of the lesson, b) Concept Knowlege, c) Application of the theory, d) Problem Solving in a practical setting, e) Spatial Relations of the design to be

developed, f) Stellation of the spacial polyhedron, g) Group Interaction and Commitment, h) Cue Card Sequencing, and i) Presentation formally in a classroom of peers.

Lesson One involved the introduction of theory and vocabulary to build a Stellated Polyhedron. C.B.A. consisted of academic and language competence dealing with concepts, vocabulary, comprehension and word usage and ability to re-phrase. Lesson Two was understanding the concepts of angles and triangles, utilizing C.B.A. of written notes, general information, and visualization to define the problem.

It is at the practical application in Lesson Three where the C.B.A. covers the symbols and rules of mathematics, but an anlysis of task commitment and on-task behaviour had to be included. Students had to measure and cut exact lengths of straws-not an easy task for a grade three child-and begin to problem solve how to assemble the design of triangles to make a polyhedron. To do these tasks led to Lessons Four and Five. Much time was spent on questionning, seeing a perspective for Problem Solving, and making Inferences. At this level, creativity, leadership and the social/emotional development of the child was evident. Once the polyhedron was completed by tying triangles of straws together, the Spatial Relationship of stellating the design became the challenge. Lessons Six and Seven were devoted to the academic competence of the student along with an analysis of the social skills within the group as each had to help another. This meant that group dynamics in forms of cooperation and collaboration became very evident.

Once the spatial stellated polyhedron was completed, the students prepared Cue Cards and practised orally in preparation for sharing their work with their Homeroom peers. Lessons Eight and Nine demonstrated student dependability, oral ability, and sensitivity to others. Thus the classes had to be rated on (S) and (T) the majority of the time. The C.B.A. also involved the thinking skills of students to define the purpose for the unit of study, to list other creative uses for the stucture , and to name some polyhedrons that do exist, such as the Epcot Centre in Disney World . Finally, Lesson Ten was a Student Evaluation of the work they had done concerning problems and their learning processes. This involved higher level thinking processes but were very difficult to evaluate from the teacher's point of view.

A TEACHER RATINGS OF COMPETENT STUDENTS resulted from the summation of scores for Language, Academic, Task Commitment,

Creativity, and Social/Emotional development. From these results, a TOTAL AVERAGE for the Student Profile was computed for each student. A RANK ORDER of the students within the class could be done from this total average.

A STUDENT PROFILE graph was drawn with a comparison of the Rating Scales totals done by: a) the Parents, b) the teacher, and c) the G/T teacher evaluation of in-class work. The graphic profiles distinguished the "non-gifted" good student who worked hard and learned well from the most able students who lacked more task commitment. This in itself would be a valuable tool for use by the G/T teacher. There was no correlation between the very high intellectual ability students and the high "curriculum based assessment. This could be expected as the curriculum based assessment used only on the academic and language components may have shown correlation. The subjective "analysis checklist" components should not have been included as an overall assessment to be correlated with the subjectively based measures. More research is indicated to clearly define the curriculum based assessment (A) and (L), from the more nebulous analysis check list ratings of (T), (C), and (S).

The statistical analyses of the Identification of Gifted and Talented using the Rating Scales approach appears most promising. To date results indicate a correlation between the Rating Scale scores of the four stakeholder groups and the Intelligence Quotient scores in the very gifted range. This research is being continued because of the exciting indications resulting from this pilot study.

The Joy of Lateral Thinking: Putting The Rich in Enrichment

Cledwyn Haydn-Jones

Teachers in the Rocky View School Division are more interested than ever in metacognition and the value of reflective thinking. Students are being encouraged to explain how they learn. Talented students, in particular, take part in challenging learning activities which are constructive, creative and critical.

The Board of the Rocky View School Division supports the Schoolwide Enrichment Model in its schools. We believe that the curriculum ought to be differentiated sufficiently to address the needs of all students. (The particular needs of talented and creative students require differentiation with greater breadth, depth and imagination.) Teachers are required to identify in their plans objectives for 'talent pool' students and enrichment strategies for the many. Consistent with Renzulli's triad model we offer types 1 2 3 enrichment activities in our schools. In Rocky View schools

1. elementary teachers offer at least Type 1 enrichment and Type 2 general enrichment strategies (creative thinking; critical thinking; problem solving; independent study and research)

2. secondary schools are required to offer enrichment seminars short courses e.g.

   (a) Type II 'special' or 'advanced' enrichment strategies
   (b) Type III enrichment projects in conjunction with curriculum compacting for talent pool students

3. schools also may apply for special project supplementary staff requisition. Schools that offer a comprehensive S.W.E. plan, qualify for supplementary staffing. There is, therefore, an option for an RP 4 (resource program level 4) for talent pool students led by a resource teacher

4. schools are assisted in their work by program specialists led by Jo Anne Koch (gifted education specialist).

In our schools we identify the talent pool (15% +); establish resource teams (principal, librarian, teacher, resource teacher) and we offer

1. **Regularly scheduled Type I enrichment** for different groupings (i.e. all students; small interest groups; talent pool)

2. **Type II General** which includes strategies/activities for all students via regular classroom program (infused/integrated into and across the curriculum). Additional enrichment activities may be blocked for Talent Pool students in time bought by curriculum compacting.

3. **Type II Special enrichment** activities for Talent Pool students via special class program under the direction of S.W.E. RP 4 resource teacher coordinator (e.g. partial pull out). The Program usually includes two components

   (a) **artifact box exchange** (grades 2 - 4) and **advanced research/communications** (grades 5 - 9)
   (b) **revolving door** (selected mini courses determined by student interest)

4. Type III Student Integrated projects for talent pool students in grades 6 - 9 (i.e. research with "redeeming social value").

5. P.E.P. (Personalized Education Program) for each Talent Pool student.

A major focus in Type II Special Enrichment activities is the development of thinking skills (we remember the adage 'thinking to learn; learning to think'). Sandra Kaplan may have recommended curriculum differentiation; George Betts the autonomous learner model; but Special Enrichment in Rocky View has been influenced by Edward de Bono's 'lateral thinking or CoRT Thinking (Cognitive Research Trust).

Small groups of students are exposed to enrichment strategies that focus on the complexity of language; epistemology; different ways of defining and analysing problems; reformulating situations; the promotion of synthesis. judgement and thoughts that diverge from the norm, the philistin or the banal.

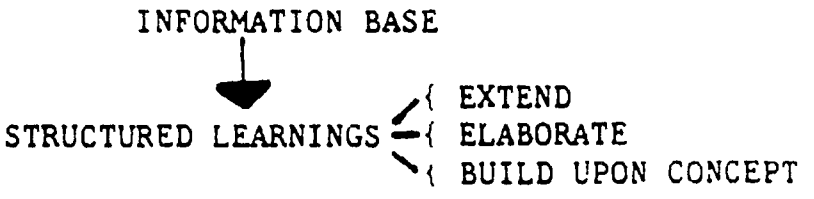
In this session we will examine strategies for dyads and small groups that maximise

1. group inquiry learning
2. self directed learning
3. research skills in learning centres
4. problem solving
5. creative questioning
6. modification/differentiation of the content (THE RICH IN ENRICHMENT!)

In #6, for example, we have an enrichment method that is an extension of the classroom in

1. building upon a solid base of information (facts/concepts)

2. structuring learning experiences based on content modification (Roger Taylor; Lynn Sass; et al) "the prerequisites for divergent thinking" :



3. principles for developing new ideas

4. divergent thinking

Rocky View schools, led by our gifted education specialist, have been using the exciting, rich and enriching CoRT THINKING program of De Bono. De Bono believes that thinking is not a by-product of subjects like biology and history (facts and drudgery!). Thinking is a skill that needs direct attention. Thinking deserves focused attention and practice as a basic skill.

In life we all need a broad range of thinking skills to survive (e.g. priorities, objectives and other people's views). **Descriptive thinking is not enough!**

As well, we should not always equate the high I.Q. child and the effective thinker. Effective thinking has much to do with

> "... operating skills with which intelligence acts upon experience"
> (De Bono)

Information base and 'academic' intelligence are necessary conditions of problem solving; effective thinking is the sufficient condition. (As I.Q. is innate horsepower to a car, so thinking skill is complementary to ability to drive.)

In a well structured lesson our students savour the joys of CoRT Thinking which helps them to look at situations and phenomena in different ways such as

PMI	(plus, minus, interesting)
CAF	(consider all factors)
RULES	
C and S	(consequence and sequel)
AGO	(aims, goals, objectives)
PLANNING	
FIP	(first important priorities)
APC	(alternatives, possibilities, choices)
DECISIONS	
OPV	(other people's views)

In this session the presentor will try to introduce participants to the essence of CoRT as Thinking Method i.e. to focus attention directly on different aspects of thinking and to crystalize these aspects into definite concepts and tools that can be used deliberately.

De Bono, Edward. CoRT THINKING PROGRAM (1986) 1 - 6 ISBN 008 - 034445 ... Pergamon Press; Toronto

JOY OF LATERAL THINKING PRESENTATION: SIMULATIONS/ACTIVITIES

1. Content Modification (differentiation: extension: elaboration: building upon concept)

2. Principles for Developing New Ideas

3. Divergent Thinking

4. PMI (Plus, Minus, Interesting) i.e. CoRT THINKING

   (a) Treatment of Ideas
   (b) Example
   (c) Practice
   (d) Process
   (e) Principles
   (f) Project

O.M. - "Odyssey of the Mind" .... A Creative Approach to Education

Vicki Hutton / Sharon Baker

Creative problem solving is considered by most educators as an essential component of gifted programming. The *Odyssey of the Mind Program* incorporates creative thinking with critical thinking skills, leadership and organizational skills, communication skills and forecasting and planning. Indeed the *Odyssey of the Mind Program* may encompass all nine areas identified by the Department of Education in Alberta as the crucial areas to be addressed in gifted education.

Our students, as future problem solvers, need to be self-reliant and to know how to take initiative. The program, with the coach as a guide, teaches students responsibility for their actions and interactions, gives them confidence in solving difficult problems and helps them learn how to work as a group toward a desired goal.

The employers of the future want people who know how to learn. Given novel situations, students in *Odyssey of the Mind* struggle to seek answers, to ask good questions, and to discover expertise within the community. With the help of references, experts etc., these students find answers and work toward creative solutions. Employers also want and need people who are skilled in groups, have good interpersonal skills, good communication skills and are effective leaders. O.M. fosters growth in these areas as well. Team members gradually learn how to respect each other and to encourage ideas. These skills will help them to be more effective in tomorrow's marketplace. It is our belief that *Odyssey of the Mind* is an outstandingly effective program to develop creative problem solving skills in our students.

The Odyssey of the Mind Program

The *Odyssey of the Mind Program*, under the auspices of OM Association, Inc., a not-for-

profit corporation, promotes divergent thinking in students from kindergarten through college. This program offers students a unique opportunity to participate in challenging and motivating activities both inside and outside their regular classroom curriculum. Students learn to work with others as a team. They develop self-confidence by creating solutions, evaluating their ideas and making final decisions. They develop their creative skills through problem solving and independent thinking. Hence, the *Odyssey of the Mind Program* makes learning fun.

To participate in the *Odyssey of the Mind Program*, the school must become a member of OM Association. Members come from throughout the United States, Canada, Mexico, China, and Australia.

A Regular Member

A *regular* member is any school or school program that joins the O.M. Association. Annual membership concludes July 31. A *regular* member receives a membership packet containing:

- an *OM Handbook*, explaining the rules of the association;
- the current annual long-term problems - four used in Division I, five used in Division II, four used in Division III, and two used in Division IV;
- a non-competitive long-term primary level problem used for demonstration only;
- a subscription to the *Odyssey of the Mind* quarterly newsletter.
- curriculum materials consisting of creative problem-solving activities correlating with the year's long-term problems. Elementary and secondary activities cover language arts, mathematics, science, social studies, and technology education. These guides may be used by teachers affiliated with the membership. The materials are made possible by a grant from IBM.

Team Competition

Odyssey of the Mind teams consist of five to seven members. They are the only persons allowed to contribute to a specific long-term problem's solution. An OM Association member may wish to have several teams in the same long-term problem and then run intramural competition to determine the best team to enter in sanctioned competition. Each team must have an adult, a teacher or a parent, designated as its coach.

Competition is by division. The divisions are as follows:

- Division I Kindergarten through fifth grade;
- Division II grades six through eight;
- Division III grades nine through twelve;
- Division IV college and university students.

The highest grade represented on a team determines the division in which the team must compete. Each problem indicates the division(s) for which competition is held.

Competing teams are judged in three areas: the **long-term problem** where teams prepare solutions and bring them to competition; **style** or the enhancement of the long-term solution; and the **spontaneous problem** given to the team on the day of the competition. The long-term problem is worth a maximum of 200 points, style is worth a maximum of 50 points, and spontaneous is worth a maximum of 100 points. The total of these three scores determines the team's rank in competition.

Teams in most locations of Canada compete on a provincial level. Teams advancing from each Provincial association's final competition become eligible to attend the World Finals. The 1990/91 World Finals will be held in Knoxville Tennessee on May 22-25, 1991.

The Odyssey of the Mind Problems

Each year new long-term problems are developed in order to cover a wide range of interests. Some are engineering problems while others are performance oriented. In the past,

problems have included designing, building and driving spring-powered vehicles, as well as creating and performing a musical scene in a classic book. The problems have limitation on cost and presentation time, as well as other specifications. Some longer-term problems are designated as non-linguistic. Hence, although English is the official language of *Odyssey of the Mind Program*, language is not a barrier to individuals speaking other languages or to deaf people.

The spontaneous problems usually take a few minutes to solve. Some spontaneous problems are verbal, while others are *"hands-on,"* such as moving raw egg with the implements given through a series of obstacles. Teams do not know these problems in advance of the competition.

A Few Considerations

- A member does not have to enter teams in competition. Joining the OM Association simply give the member the option to compete.
- The program is often used for students in gifted and talented programs. However, highly creative students as well as those with artistic and performance talents may not qualify for some gifted and talented programs. The *Odyssey of the Mind Program* offers a wonderful opportunity for such students. OM suggests that all students be given the opportunity to participate.
- Members may select the problems in which they wish to compete. It is not necessary to have a team in each problem.
- In order to help provide training and general classroom problem-solving activities, members and non-members may wish to purchase the OM books containing past long-term and spontaneous problems.
- Members entering competition may wish to purchase an additional program handbook for each coach.
- *Odyssey of the Mind Program* team members who are high school juniors or seniors, or

full-time college students may qualify for OM scholarships. Both monetary and specific college/ university scholarships are available.

More Information

If you are interested in the *Odyssey of the Mind Program* in Alberta and would like more information, you can contact the following individuals:

Sharon Baker
534 - 17th St. South
Lethbridge, Alberta
T1J 3C3
328-0999 (home)
329-0125 (school)

Vicki Hutton
Box 942
Vulcan, Alberta
T0L 2B0
485-2631 (home)
485-2074 (school)

Odyssey of the Mind
P.O. Box 27
Glassboro, New Jersey
08028

WHAT IS O.M.?

Teamwork

Respect/responsibility

Adaptability

Novel

Student centered

Fun/flexible

Open ended

Risk taking

Multigraded

All kids

Thinking skills

Integrated

Originality

New encounters

For whom is this **TRANSFORMATION**? It is for **ourselves**, as coaches, as we view creative problem solving in a unique way. It is for ourselves as we, too, become creative problem solvers. And the transformation is also for our **students** as they gain confidence in their own abilities and as they emerge as effective group members with increased communication skills and actively involved in an exciting creative problem solving program.

Cracking the "Gifted Shell" -- How Shad Valley Works to Bring Out the Best in Gifted Teenagers

Thomas P. Keenan

Introduction

For one month every summer, my life is transformed. I go from being a University professor who wears suits and applies for research grants to a very casually dressed guru for fifty of Canada's brightest high school students. For a month we live, work, and play together. The experience changes me, and I believe it changes them.

By most measures, these kids are not hard done by. Most come from good, loving homes. Many have the $120 sneakers and designer label clothes. And when their schools need to send somebody to a Model Parliament or debating contest...these are the kids who get to go. But at another level, many of the students who come to Shad Valley are needy. It's hard to define what's missing in their lives, since they seem to have everything, much more than their peers. Perhaps a clue can be found in the Book of Genesis. Adam was miserable in the Garden of Eden because he was alone. Or rather he had lots of nice birds and flowers. But he lacked someone (more or less) like himself.

When you're the smartest kid in your school[1] it can get lonely at the top. Some highly gifted students adjust well and get involved in Student Councils, Yearbooks, Clubs, etc. Others develop hobbies or obsessions (computers are a common one) that they can pursue alone. But a lot of their assumptions are challenged the minute they arrive at the doorstep of Shad Valley.

What is Shad Valley? En Quoi Consiste Shad Valley?

But I'm getting ahead of myself here. There wouldn't be a Shad Valley program without a man named Dr. Derek Lane-Smith. Around 1980, "Derek" (as everyone calls him) decided that Canada's most gifted students were also, as he put it, "the most underprivileged" since there were few programs that really challenged them. Many have been through enriched classes but the only programs that I have heard Shads speak highly of are the IB (International Baccalaureate) and Mentoring programs that involve working with scientists at Universities.

[1] I once sorted the Shad Valley applications by academic rank (where available) and was amazed to find that I had to go halfway down the pile to find someone who didn't rank first in his or her graduating class! So we are getting the top students as Shad applicants.

Derek decided to fill the gap by offering a month long summer program for high school students. His target audience was "the top 2%", though he was a little vague on how to measure that. He arranged facilities (at St. Andrew's School in Aurora, ON) and chose the subjects (Mathematics, Computer Science, Engineering and Entrepreneurship.) Then all he needed was money! Through a series of both smart moves and lucky breaks, he scraped together enough to run the program in 1981 for about three dozen students, mainly from Ontario. The funding came from corporate sponsors as well as parents, a model that has been preserved and refined. The program ran again in Aurora in 1982, then was "adopted" by the University of Waterloo in 1983. In 1984 Shad Valley expanded to Calgary and I was appointed as the founding Director of that Program. It now runs on eight campuses, coast-to-coast.

The programs differ slightly depending on the expertise and facilities available at each location. They are conducted in English except for the francophone program at Sherbrooke. Here are the common points:

-students from anywhere in the country may apply to any program
-the programs run concurrently for four weeks in July
-applications are distributed[2] and processed centrally, but read by faculty at all programs
-funding is secured by the central office with help from the individual programs and committees of local businesspeople
-the programs are open to students who have completed grade 11 or 12
-the subject matter varies somewhat but includes: mathematics, technology, and entrepreneurship
-most of the students receive a "work term" with a sponsoring company for the part of the summer after Shad Valley
-a student may only attend Shad Valley once in a lifetime

The "Gifted Shell" and Shad Valley

It would be impossible to come up with a "typical" or "composite" Shad and they would probably smother me if I tried to start making blanket statements about them. So instead, I will just comment on *some* attributes that *some* Shads have exhibited and how we address them in the program! I'll illustrate with brief excerpts from a few letters I received recently from 1990 Shads (*shown in italics.*)

Superiority Complex. Frankly, this usually takes care of itself! Picture a group of Shads sitting around the dinner table. One of them makes a witty remark, and waits for the reward of laughter. Instead, someone else says something that's even cleverer. It's fun to watch the expression on the first Shad's face...."did he/she really say that?" Usually the dismay turns to delight pretty quickly at realizing that they're around intellectual equals for a change. As one Shad90 student put it:

When we started discussing our ideas, we had some really difficult moments because we all thought that we had good ideas! It was sometimes hard not to have your feelings hurt because someone didn't like your idea. But did I like it? YOU BET I DID!!! The ideas that everyone else came up with just BLEW me away! They were AWESOME! If I am ever in a decision making situation again, I want Shad-types to be in attendance!!!!

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2 Contact address: Canadian Centre for Creative Technology, 8 Young Street East, Waterloo, ON N2J 2L3 (519) 884-8844

I also learned to trust people. Have you ever been in a team situation where you had to give jobs to certain people, and you didn't really want to do it because you thought that some people just wouldn't do as good a job as YOU would? I have. I always want the BEST. So sometimes, I like taking several responsibilities because I don't want other people to screw it up or do a mediocre job. But at Shad ... I was only TOO HAPPY to let other people do the job. Because I knew that they would do as good a job, or far better, then I would do! I think this touches upon what John said about 'launching big ships in deep water'. I wouldn't hesitate to have ANY of you on MY ship, I'll tell you!!! (Alan Renaud, Shad Valley Calgary 1990)

Inferiority Complex Particularly among siblings of previous Shads, or those who have heard a lot about the program, there is often a great deal of fear that "I won't be able to keep up with these people" This concern is not unreasonable since in the lectures and seminars we often use graduate school level materials (without admitting it!) It is easy to get overwhelmed, but the professors and teaching assistants are always around to help, and are told to watch for people who need some coaching or encouragement. We do practice a certain amount of "tracking" particularly in the computer and mathematics areas, where there is often a wide range of experience and confidence. So, for example, in the first week Shad Valley Calgary 1990 students could choose from:

- *From Pythagoras to Digital Sound* (on the mathematics of music)
- *Computer Viruses and Security* (on machine coded viruses and operating systems - i.e. pretty advanced stuff)
- *Pascal Striptease* (the title refers to the "top down" approach to programming...this is essentially a one term Pascal course rolled into a week -- complete with a project! It's what we urge those with little computer experience to take)

Discipline "Good student" does not always mean "good" student as anyone who has worked with gifted young people knows! We have more than our share of practical jokes and pranks, and since Shad are smart and resourceful, they come up with sophisticated capers. Sound-sleeping Shads have awakened to find themselves and their entire bedrooms moved into the dormitory elevator. Electronic mail has been "forged" quite convincingly. And once, while cleaning out a Shad's room after departure, I found a giant cotter pin inscribed with the logo of an amusement park. I wonder which ride it came from! Generally, of course, they are just typical teenagers. However, since we all live together 24 hours a day, 7 days a week, we see all aspects of their (mis-)behavior.

In terms of doing work and assignments, these are students who typically have no trouble completing their school work. In some cases they may lack motivation in school (particularly if they think the work is boring) but there's no question they have the ability to do it well. In Shad Valley, the math, computing, entrepreneurship and engineering assignments are a whole different matter. In computer science for example, they have to "create a finite state (Turing) machine to do binary addition. " Most 3rd year University students would have a hard time with that one. We give them support (i.e. the teaching assistants and professors hold tutorials at midnight if necessary.) There *is* something a little bizarre about having somebody bang on your door at 2:40 AM to ask how to solve a partial differential equation, but after you wake up it's actually quite a moving experience!

A particular aspect of Shad Valley that has become somewhat notorious is the "genius mission." Devised by Dr. John Pliniussen, who has been with us at Shad Valley Calgary since 1985, this unique piece of torture is meted out to those who commit an infraction like arriving late to lectures, losing their name cards, or anything else detrimental to the good working of the group. They're called genius missions because they are onerous tasks that usually have a clever solution. "GMs" are often given out to several students together, which produces an interesting kind of bonding. It is not unusual for recipients of these "punishments" to stay up all night working on their solutions. In fact, one of the problems is that genius missions acquire a certain status value and people break rules just to get them!

A few sample 1990 genius missions and their solutions:

•*For the next 24 hours you will be tied together.* (given to two people, often but not always of the same gender.) The two Shads who received this GM produced two signs. One said TI and one said DE. Whenever they were seen they made sure they were in order so they were "tide."

• *Make a 1:12 scale drawing of the Shad bicycle* (The 1:12 is in there because people in the past have made their drawings 1:2000 scale, drawing just a dot on the paper!) The most innovative solution to this task (which would be quite tedious if taken literally) was to solve it photographically. However, one of the victims (recipients of the genius mission) realized that this could be faulted because of distortion due to perspective. Someone knew how horse race photo finish cameras work -- they have a moving lens to avoid distortion. What else has a moving lens? The photocopier! Suffice it to say that at 3 AM I saw six people holding a bicycle on top of a photocopier perched eight feet off the floor (so it could be exposed by the overhead fluorescent lights, of course!)

Continuity Space does not permit citing more evidence of the behavior change that occurs in Shad Valley but here are a few quotations from students after the 1990 program. By the way, these comments are totally unsolicited and were produced for their peers, not to impress anyone. They are reprinted with the students' permission:

Shad was a training seminar, and U are a carrier of it, Its goes with you, you have to feel that same pressure, and attitude of performance all across Canada. 51 special Shads, and 10 motivator Shads, (the staff - ed.) are out there. And i bet they all feel the same, oh i miss Shad. Well we are working together not in the same room, not even the same city in some cases. But together we can do Anything!!!!!!!!
(Colin LiPi Shan, Shad Calgary 1990)

It would be cruel and inhuman to send them home from an experience like this with no follow up. So we encourage them to get together, have reunions, and, most of all, to communicate. One particular support mechanism is the Multics™ electronic mail system which the University of Calgary generously extends to Shad Valley students. They are allowed to keep their accounts after they leave the campus, and in the past the university has even paid their data communications charges. Now, with computer networks like BITNET and INTERNET, they are being asked to find their own communications resources. But we know they will, even if they have to show some of the entrepreneurial spirit that is fostered in Shad Valley!

Conclusion

Because of space limitations, this paper has focused on empirical observations made in the course of seven summers of involvement with Shad Valley. Many of the educational underpinnings of what we do in Shad Valley come from the principles and practices of Adult Education, specifically those ideas that are often referred to as "andgragogy" (as distinguished from "pedagogy.") Among others things, they are encouraged to[3]:

- bring their own life experience to the educational transaction
- question authority figures (the professors even challenge question each other!)
- put their learning into immediate action
- work and learn collaboratively
- show mutual respect

We do treat the Shads as adults, subject to the rules that we have to enforce for their own safety and welfare. In fact, the challenges they face in the program make it difficult for those in grade 11 to return to their "normal" high schools. Even those going into University often find the pace is not as demanding as what they experienced in one month at Shad Valley. And yes, I believe it changes these students for the better. Most of them seem to agree:

Shad Valley is absolutely, positively the best thing I have done in my whole entire life. (Rebecca Spagnolo, Shad Valley Calgary 1984)

Shad has become such an important part of my life that when I look back, I can't imagine life without it. (Karthik Srinavasan, Shad Valley Calgary 1990)

Acknowledgements

I am grateful to the almost 400 Shad Valley Calgary students I've worked with since 1984. I would particularly like to thank those who kindly allowed me to draw on their electronic mail comments for this paper. In addition, I'd like to thank all the staff members I've worked with over the years, particularly my Computer Science Teaching assistants David Moloney, Peter Graw, Daryl Spitzer, John Harrison and Roland Stanich. And I'm especially grateful to Professors John Pliniussen and Gordon Fick who have been instrumental in making Shad Valley, especially Shad Valley Calgary, what it is today.

T.P.K.

[3] These five principles were identified by a group of doctoral students at Columbia University as being core tenets of Adult Education.

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Hidden Treasures in Children's Literature
Energizing Thinking with Non-Traditional Children's Books

Linda Kirstein / Kathy Knight

"C D B! D B S A B Z B. O, S N D?" Is this literature? Certainly not in the traditional sense of the word. Yet this is a direct quote from the first page of a children's book entitled C D B by William Steig, a widely acclaimed children's author. C D B is an enjoyable, challenging book in which words are made out of the sounds of letters and numbers.

Books with unusual themes or formats such as C D B can be found in many libraries, but because of their non-traditional nature, they may be overlooked. These unconventional "hidden treasures" can encourage divergent thinking and intellectual risk-taking, as well as challenge children to stretch their imaginations.

The books presented in this workshop all have an element of the unexpected, sometimes taking the ordinary and treating it in a very extraordinary way. They often deal with abstractions and inferences. They often contain sophisticated humour. All these books play with images and ideas, opening young minds to other possibilities.

The books included in this presentation and in the following bibliography were chosen because they lend themselves to learning experiences that may energize children's thinking.

Books such as The Important Book, Faint Frogs Feeling Feverish, The Jolly Postman, and A My Name is Alice present patterns which entice children to explore similar patterns based on their own perceptions. Other books, such as Look Again, Round Trip, Graham Oakley's Magical Changes, and Alphabatics challenge children visually.

The wonderfully unusual Thirteen can be read over and over again, each time revealing new surprises. It would be difficult, if not impossible, for any child to read The Mysteries of Harris Burdick without feeling compelled to create a solution to at least one of these bizarre mysteries.

From a diagnostic point of view, using these and similar books in the classroom can indicate to the teacher which children are comfortable with risk-taking, divergent thinking, problem solving and able to tolerate ambiguity.

One of the major benefits of using non-traditional picture books with children is that it exposes them to nonconforming views of the world which in turn fosters independent thinking.

As a final word, here is the solution to the puzzle posed in the first paragraph: "See the bee! The bee is a busy bee. Oh, isn't he?

D N

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Ahlberg, Allan and McNaughton, Colin. Foldaway Zoo. London: Granada Publishing Ltd., 1984

- lots of fun in this picture book with pages that pull out to reveal comical surprises.

Ahlberg, Janet and Ahlberg, Allan. The Jolly Postman or Other People's Letters. London: William Heinemann Ltd., 1986

- a picture book that contains real letters to well-known characters to open up and read. Inside the envelope for the three bears is a "sorry" note from Goldilocks, for example.

Bayer, Jane. A My Name is Alice. New York: Dial Books for Young Readers, 1984

- an alphabet book which follows the pattern 'A my name is Alice and my husband's name is Alex. We live in Alaska and we sell ants." Steven Kellogg's hilarious detailed illustrations accompany the text.

Brown, Margaret Wise. The Important Book. New York: Harper & Row, 1949.

- this picture book poetically describes the important characteristics of everyday things such as grass, an apple, snow and a shoe. Good for patterning and encouraging analytical and evaluative thinking.

Brown, Ruth. If at First You Do Not See. London: Andersen Press. 1982

- a hungry caterpillar thinks he has found some tasty morsels until he looks again (reader then turns page upside down) and some very different things appear.

Charlip, Remy. Arm in Arm. New York: Parents' Magazine Press, 1969

- a collection of circular stories, word plays, unusual connections, endless tales and intriguing illustrations.

Charlip, Remy and Joyner, Jerry. Thirteen. New York: Parents' Magazine Press, 1975

Charlip, Remy and Joyner, Jerry. Thirteen. New York: Parents' Magazine Press, 1975

- a unique picture book which presents 13 different stories which simultaneously unfold over 13 double-page spreads. This book can be read many times, and each time new ideas and insights discovered.

Elting, Mary and Folsom, Michael. Q is For Duck. New York: Clarion Books, 1980

- a guessing alphabet book. "A is for zoo - because a zoo has animals. Q is for duck - because a duck quacks" and so on. Illustrated by Jack Kent.

Hoban, Tana. Look Again. New York: Macmillan Publishing, 1971

- a book of black and white photographs, each one preceded by a page with a cut-out that reveals only part of the photographed object. Children try to identify the object.

Jonas, Ann. Round Trip. New York: Greenwillow Books, 1983

- in an inventive format, when the reader arrives in the city at the end of the book, the book is flipped over and read back to the beginning. The black and white pictures take on new meanings through masterful use of contrast. Shows a picture can be seen in more than one way.

Kitamura, Satoshi. What's Inside? The Alphabet Book. London: Arrow Books, 1985

- a guessing alphabet book. Children look at visual clues to guess what is hiding in the picture that begins with the letters of the alphabet. Challenging.

MacDonald, Suse. Alphabatics. New York: Bradbury Press, 1986

- each letter of the alphabet is shrunk, expanded and manipulated into something entirely new: the letter A becomes an ark, C a clown's smile, S a swan.

Moerbeek, Kees. Beware of the Pog! U.K.: Child's Play International, 1987

- a mix and match pop-up book. The heads and bodies of the animals can be mixed to create such new animals as a "pog" - pig + dog.

Oakley, Graham. Graham Oakley's Magical Changes. London: Macmillan Publishers, 1979

- ingenious split pages create 512 weirdly different and amusing scenes.

Obligado, Lillian. Faint Frogs Feeling Feverish. New York: Viking Penguin, 1983

- an alphabet book of tongue twisters with humorous colored illustrations of phrases as "messy mice making marmalade". Good for patterning.

Steig, William. CDB! New York: Windmill Books/Simon and Schuster, 1968

- a puzzle book. Words are made out of the sounds of letters. D N S 5 X = the hen has five eggs, C D B = see the bee. Delightful cartoon illustrations give clues to the puzzles.

Turkle, Brinton. Deep in the Forest. New York: E.P. Dutton, 1976.

- a clever wordless turnabout on the Goldilocks story. A curious bear cub wreaks havoc in the cabin of a pioneer family out for a walk.

Van Allsburg, Chris. The Mysteries of Harris Burdick. Boston: Houghton Mifflin, 1984

- fourteen spectacular, but eerie black and white illustrations each have a mystifying title and caption meant for students to use to create a story.

Van Allsburg, Chris. The Z Was Zapped. Boston: Houghton Mifflin, 1987

- wonderful black and white illustrations depict how A was in an avalanche, B was badly bitten, C was cut to ribbons and the other letters of the alphabet suffered similar mishaps. Children are encouraged to guess what has happened to each letter.

The Schoolwide Enrichment Model
A Comprehensive Plan for General Enrichment and Special Provisions for the Gifted and Talented

Jo-Anne Koch

INTRODUCTION

Rocky View School Division's RESOURCE PROGRAM 4 model (figure 1) is largely an adaptation of Renzulli and Reis' Schoolwide Enrichment Model (1985). The services collectively comprising the Schoolwide Enrichment Model have been so effective in developing "giftedness" in students that they have been more widely adopted and implemented in schools throughout North America than any other set of ideas put forth on this topic in the educational literature.

BACKGROUND

The evolution of the Schoolwide Enrichment Model began in the late 1970's with the development of the Three-Ringed Conception of Giftedness and the Enrichment Triad Model (Renzulli 1976, 1977). This model quickly became the most popular programming model for serving gifted and talented learners. However, it was quickly discovered that many kinds of enrichment and special services that were provided within the Triad Model could (and should) be used with a much larger group of students (than the 3 to 5 percent traditionally served in gifted programs) and, in some cases, with all students. The Enrichment Triad Model was therefore modified to include a component known as the Revolving Door Identification Model (Renzulli, Reis and Smith, 1981).

The Revolving Door Model was designed to "revolve" more students (ie roughly 15 to 20 percent of the general population) into and out of the different enrichment activities and services that have traditionally been reserved for the "gifted and talented". However, once again it was quickly discovered that, as effective as the Revolving Door Model was, there was a need for further strategies and procedures whereby the general faculty could be more actively involved in the school's enrichment and gifted program. The resulting revisions formed the basis for the present Schoolwide Enrichment Model (Renzulli and Reis, 1985).

The Schoolwide Enrichment Model provides a solution for most of the

problems that plague programs for the gifted and talented. Among these are:

- the hard core separation of gifted programs from the regular school program;
- the removal of students from the regular curriculum and the resultant tendency to require students to "make-up" work they "missed";
- the selection criteria (ie. artificial cut-offs); and
- decisions regarding the appropriateness of enrichment activities.

OVERVIEW OF THE SCHOOLWIDE ENRICHMENT MODEL

Advantages

The Schoolwide Enrichment Model has a number of advantages over other enrichment and gifted programming models. The Schoolwide Enrichment Model:

- is based on extensive research in the following areas: defining giftedness; identification, selection and placement procedures; enrichment activities and acceleration approaches;
- is practical and flexible. Besides providing various kinds of enrichment to a broader spectrum of the school population, it offers defensible programs of independent study for gifted students by recognizing that "Type III" investigations, inventions and artistic productions differ from traditional school research projects in a number of ways (eg. breadth, depth, novelty and degree of task commitment);
- provides both high achievers and high potential underachievers with opportunities to develop interests that might spark the personal desire for advanced-level independent study;
- recognizes that cognitive and affective processes or skills are means and not ends in themselves by infusing them (gradually) within the learning situations afforded by the various curriculum areas;
- involves the total school in various aspects of the program, thereby minimizing concerns about elitism and the negative social ramifications (within a peer group) that may result when students are pre-selected for segregated programs;
- recognizes that effective change in educational practices can only be achieved by actively involving classroom teachers in the planning and decision-making aspects of program planning; and
- provides a framework for a program that will be of interest to <u>all</u> parents as opposed to only a small group.

Resource Program 4

Overview of the Schoolwide Enrichment Model

GOALS	Self Actualization		Creative Productivity
SERVICE DELIVERY COMPONENTS	TYPE III ENRICHMENT INDIVIDUAL AND SMALL GROUP INVESTIGATIONS OF REAL PROBLEMS *(Talent Pool Students)*		
	TYPE I ENRICHMENT General Exploratory Experiences	TYPE II ENRICHMENT GROUP TRAINING ACTIVITIES General *(All Students)*	Special *(Talent Pool Students)*
	Personalized Education Program (PEP) Plan *(Talent Pool Students)*	Classroom or Subject Teacher	Resource Program 4 Teacher
		Community Resource Personnel	
	CURRICULUM COMPACTING		
ORGANIZATIONAL COMPONENTS	STAFF DEVELOPMENT ACTIVITIES		
	Flexible Identification Procedures	Schoolwide Enrichment Team	Parent and Student Orientation
	Program Indicators Summary Sheets	Annotated Catalogue of Process Materials	Process Categorized Planning Matrix
	Planning Guides for Service Delivery Activities *(Action Forms)*		Evaluation Instruments and Reports
OBJECTIVES	Expand Services to a larger Proportion of the School Population	Integration with Regular Curriculum General Faculty Participation	Minimize Elitism Label the Services Rather than the Students
	Develop Creativity and/or Task Commitment in Above Average Ability Students	Provide Learning Experiences and Support Systems that Promote the Interaction of Above Average Ability, Task Commitment and Creativity	Provide Opportunities, Resources and Encouragement for the Development of Gifted Behaviours
RATIONALE	Research Underlying the Three-Ring Conception of Giftedness	Theories of Sternberg, Gardner and Others	Richardson Study

Figure 1.

Services to Students

The Schoolwide Enrichment Model seeks to achieve excellence by building upon the strengths and interests of school staffs and by focusing on the delivery of five major services to students. These services include:

- identifying students' academic strengths, interests and learning styles;
- curriculum compacting; a process that streamlines the regular curriculum;
- general exploratory activities (ie. Type I Enrichment) that introduce students to a wide variety of topics and fields of study not ordinarily covered in the regular curriculum;
- group training activities (ie. Type II Enrichment) that develop the higher level thinking and affective (feeling) processes; and
- individual and small group investigations of real problems (ie. Type III Enrichment projects).

RESOURCE PROGRAM 4 KEY FEATURES

Although the development of Rocky View's enrichment and gifted program has closely mirrored the evolution of the Schoolwide Enrichment Model, its current Resource Program 4 model (figure 1) also incorporates a number of other elements or features. These include:

- a system-wide philosophy of enrichment and gifted education which is grounded not only in the research underlying the Three-Ringed Conception of Giftedness (Renzulli, 1976) but also in the recent theories of Robert Sternberg, Howard Gardner and others as well as on the "Summary of Recommendations" from the extensive Richardson Study (1985), all of which are reflected in the program's objectives and goals;
- a system-wide definition of giftedness and an identification, selection and placement process which is based on Renzulli's Three-Ringed Conception of Giftedness and features a five-phase Identification, Selection and Placement Procedure (figure 2);
- system-wide coordination in the form of specialist consultation, an informal networking system for Resource Program 4 teachers, a separate section in Rocky View's Pupil Services Handbook (currently under revision), and a "Resource Program 4 Teacher's Handbook" (currently being developed);
- school-based staffing in the form of a part-time Resource Program Teacher (ie. .2 to .6 F.T.E. depending on expressed need);

IDENTIFICATION, SELECTION AND PLACEMENT PROCEDURES FOR RESOURCE PROGRAM 4

Phase I Initial Screening

- Identify potential candidates by reviewing:
  - standardized test scores
  - other objective/subjective measures of student ability and/or achievement and portfolios of student work
  - recommendations by classroom/subject teacher(s)
  - students recommended by alternate pathways (eg. self, peer or parent nominations; results of individual ability and/or achievement tests)

Phase II Further Screening

- Collect and review pertinent data on potential candidates

Phase III Selection and Placement of RP4 Students

- Resource Program 4 Nomination Form
- Annual placement and review
- 15% pool

Phase IV Develop Differentiated Program for RP4 Student

- P.E.P. Plan
  - regular classroom
  - special class

Phase V Notify Parent of Student's Differentiated Program

- Review P.E.P. OR •Notify of specific provisions

Figure 2.

- a Personalized Educational Program (P.E.P.) Plan (Koch, 1988) for each Talent Pool student which is jointly developed, reviewed and updated by the classroom/subject teacher and Resource Program 4 teacher;
- a Taxonomy of Enrichment Activities (Koch, 1990) which details general, supplementary and advanced enrichment activities;
- a centralized materials library of approximately 1000 resources which are available on loan to all Rocky View teachers and administrators. In addition, for ease of selection and assistance in planning, each school has both an annotated listing of the materials and a planning matrix keyed to a Taxonomy of Enrichment Activities (Koch, 1990); and
- Program Indicators Summary Sheets (Koch, 1990) which detail specific services comprising Resource Program 4 and are categorized as to: students served (all students, Talent Pool students), delivery system (regular classroom, special class) and enrichment focus/strand (ie. general, supplementary or advanced). These forms have been developed to assist teachers as they develop long-range and/or daily lesson plans but may also be utilized by administrators for monitoring schoolwide enrichment provisions.

CONCLUSION

Rocky View's Resource Program 4 model is still evolving and, like its prototype, the Schoolwide Enrichment Model, will continue to be revised as more is discovered in the coming years in the areas of effective general and differentiated curricula and proven teaching-learning strategies and as more insight is gained into the critical relationship between brain and mind.

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Development and Transfer of Skills Specifically Exercised in an Enrichment Program

Colin J. Laine

Introduction

The purpose of this project was to investigate the assumptions and effects of an enrichment program provided to gifted students in grades 5 & 6. It is presumed by many in the school system that gifted students (1) have extraordinary learning needs that are not fully met within the 'regular' program; (2) have learning needs that form cognitive patterns -or styles- that can be readily identified and measured; (3) have learning characteristics that distinguish them from students who are not identified as gifted; and, (4) have access to programs that set objectives appropriate to the learning needs identified.

This assumes of course, that there are programs with the 'regular' core curriculum and standard types of teaching strategies that do not allow (gifted) students to achieve an optimum level of learning. Further, we assume that the curriculum and teaching in special education programs will assist these students to develop their potential to a higher level. We wanted to find out if these assumptions are true. We wanted to see if students would benefit from special programs both within and beyond the program time. If there appeared to be no differences in the students' abilities when compared to changes in abilities from non-identified gifted students in 'regular' classes, then one must question the provision of any separate program for the gifted student. We also were interested in finding out what, if any, effect there might be for those gifted students who did not participate in a special program.

Background

Students are designated as gifted generally due to the demonstration of extraordinary performance of ability. Over time, sets or clusters of performances, translated into behaviour, have come to characterize one who is "gifted." A student who exhibits more of these characteristics, or abilities, is considered more gifted than one who demonstrates exceptionality in fewer.

Similarly, programs have been designed to parallel these abilities academically as well as intellectually; however, our record of being able to predict student success in the goals of special programs (let alone success in later life) has been poor. It is a frequent observation that the problem lies

with the student: programs have appeared more resistant to change (Gallagher, 1985). There has been growing evidence over the past decade that the heterogeneity found in gifted students may well lie not in their abilitiesbut in their cognitive styles: namely, their preferred and persistent approach to processing information. The hypothesis therefore is that if the instruction in a course or program is differentiated to reflect a variety of cognitive styles, it will reach more students, and result in a greater chance of success. A second interest was in the measurements that could be used to distinguish gifted from non-gifted students, and to examine this hypothesis.

Instrumentation

This is still an area of considerable controversy. To determine the cognitive patterns appearing as characteristics of giftedness anmd the skills subsumed in the program objectives, an aptitude test was sought which appeared to assess a range of lower-level and higher- level process skills. By testing a group of students with both the Canadian Tests of Basic Skills (the standard formal measure most commonly used in identification processes) and a differential processing test, the CTBS also could be examined in terms of its ability to identify processing.

Several models of cognitive style, (derived from cognitive controls - Gardner, Holzman, Klein, Linton, & Spence, 1959; Klein, 1954), have been proposed. Among those most frequently examined are: conceptual style, productivity, and conceptualization (Messick, 1976); field independence - field dependence (Witkin, 1974); and impulsivity-reflectiveness (Kagan, Rosman, Day, Albert, & Phillips, 1964). Unlike achievement, these styles are bipolar; that is to say, ends of each spectrum may be equally valuable and more easily differentiate approaches to learning. ("More" is not necessarily more valuable than "less").

Guilford (1930) proposed that several of these styles could be fitted into the information-processing model: the Structure of Intellect (Guilford, 1967). Several instruments were considered which are designed to measure the process of learning rather than the products. Among these was the Structure of Intellect Learning Abilities Test (Meeker & Meeker, 1976) modelled after Guilford's S.I. model. This was the most comprehensive of the aptitude-based tests examined. Further, it was the least known in the region, and therefore less likely to be affected by prior learning. The dimensions examined included both lower-level and higher-level operations (cf. Bloom, 1956) and products (cf. Piaget p.24). Further, Guilford (1977) hypothesized that certain, and possibly all, of the tests on the products dimension act as second-order operations, or advance organizers (Ausubel, 1978).

Method

The initial sample comprised 82 students, grades 5 and 8 who had previously been nominated by their teachers for the district enrichment program. From the screening process, which included scores from the CTBS, 42 were identified as gifted and selected for the program, and 6 were identified as gifted, but not selected to participate. Thirty-four students of the nominated students were not classified as gifted and pursued the regular program of studies full-time. Students came from a variety of socio-economic and cultural backgrounds and the sample was gender balanced as far as possible.

The SOI-Learning Abilities Test provided the exploratory measure of cognitive style. The Operations and Products dimensions were extrapolated in accordance to the Manual (Meeker, 1985). The contents dimensions were not included in the discussionm as there appeared to be no difference in scores of Figural, Symbolic, and Semantic Contents among the students. The CTBS and SOI scores were converted to T-scores to enable direct comparison across grades and categories, and then compared for significant congruency.

The Program

A task analysis of the program found four broad teacher-designated areas (Critical thinking, Creative thinking, Problem solving, Independent study). These areas were decomposed into information processing sets related to Guilford's Model and focussed on cognitive styles. Ten of the eleven dimensions appeared in the task analyses. The foci of the objectives were: Cognition, Convergent Production (Operations); Semantics (Contents); Implications (Products)-(see chart attached). This decomposition allowed a comparison between identified students' abilities and curriculum demands.

Teachers' Style

The style used by the teachers was assessed as being traditional and well-defined: convergent, systematic, evaluative, and consequential (implications). These dimensions appeared most frequently in the program analyses and the teachers' styles: the teachers also had a strong eye for detail (units). This pattern fitted only those students gifted in academic ability (Laine, Blank, & Clark, 1985). Students who were considered more creative, specifically talented, and more independent persons generally did not parallel the teachers' and program's stylistic demands.

Data analysis

The Structure of Intellect Learning Abilities test was administered to the students at the start of the special program, at the end of the program (12 weeks), and again at the end of the year. Data were also collected on the CTBS, and on the teachers assessment of the students' abilities in the three cognitive areas of the special program: problem-solving, critical thinking, and creative thinking.

Summary of Results

1. The identification process distinguished the gifted students generally by academic achievement (CTBS). Transformations (SOI) was the only distinguishing style characteristic.

2. The CTBS generally was related to lower-level dimensions of aptitude (Cognition, Memory, Units). Only the CTBS Work/Study Skills cluster related to higher-level dimensions

3. A repeated measures analysis found that Cognition, Evaluation, Convergent Production, Units, and Transformations were significantly changed in the program participants over the twelve week program. After a further 12 weeks, only Convergent Production, and Transformations abilities continued to advance significantly.

4. A regression analysis found only Cognition contributed significantly to Problem-solving ability as evaluated by the program teachers.

5. Only Vocabulary (CTBS) contributed significantly to the evaluation of students' Critical Thinking ability; no formal dimension distinguished or contributed significantly to students' Creative Thinking ability.

6. Significant differences between gifted students who participated and those who did not participate in the special program were found in Evaluation, Convergent Production, Units, Systems, and Transformations. Of these, only Convergent Production was a focus of the program objectives.

7. A study of the profiles of students in all grades showed a consistent pattern of strengths in the gifted students in Systems, Transformations, and Implications .

8. A study of the profiles showed that the gifted student who participated changed over time compared to those of the non-participants. An important observation was in the Operations profiles. A similar pattern in the profile of the non-gifted students at the start of the

investigation is found to that of the gifted non-participators at the end of the year. When these patterns were graphically regressed, there was no significant difference between them. The scores of the gifted non-participators were, however, significantly higher than those of the non-gifted students throughout.

It is important to note at this stage that no student identified as gifted at the start of the year but who did not get selected for the special programs was identified as gifted at the end of the academic year. They were all nominated and considered ". . . very capable - but not gifted".

Discussion & Conclusions

This study has shown that a typical identification process that was stated as being "multi-dimensional" in fact distinguished the gifted students from the non-gifted primarily by academic achievement - even though the teachers involved stated that they did not take much notice of the CTBS scores. The one CTBS cluster that the teachers said were not looked at - CTBS Work/Study Skills - in fact would provide the best indicator from the CTBS of higher-level dimension ability. The SOI alone did not distinguish the gifted from the non-gifted students; therefore without the use of the CTBS, there appeared to no consistent discriminating indicator in the identification process. Cognitive ability between gifted and non-gifted students appears to be more by degree than by dimension.

The consistent pattern of strength in higher-level products in the gifted students supports the observations of Guilford (1980) and indicates a preference for higher-level organization of information. This consistent pattern would not be assessed using the CTBS. In the evaluation of the program's objectives, little in either academic achievement (CTBS) or cognitive style(SOI) related to the teachers' assessment of the students' abilities. We were unable to find any clear indicator or standard by which the teachers had evaluated the students' relative standing in problem-solving, critical thinking, or creative thinking. Vocabulary was marginally associated ($p<0.10$) with critical thinking. Previous researchers (e.g. Beckwith, 1982; Meeker, 1973a) have found Vocabulary to be a reliable indicator of perceived superior ability. If Vocabulary is observed as a greater ability to communicate ideas, then those students with a superior vocabulary may be rated by teachers as superior thinkers.

The profiles over time indicate that few metacognitive skills are advanced through participation in the program. In follow-up interviews, the resource teachers reported spending between 50% & 75% on developing Critical Thinking and about 25% on Creative Thinking skills. Nowhere in the reports did they list "Evaluation" as a specific skill taught and assessed. While they reported encouraging discovery (SOI-Relations), the grade five teachers listed "logical formation of ideas" (SOI-Systems) as a higher

priority in assessing students' reports. There was also no consensus among the teachers as to which particular strategies constituted the development of 'Critical' as opposed to 'Creative' thinking. It is open to interpretation whether or not the strategies used, or the type of work done, or the manner in which these particular thinking skills were assessed, were consistent with the stated program objectives within or across grades. The results suggest not.

One feature that must be noted again is the similarity of patterns between those students nominated but not identified as gifted at the start of the year, and the non-participating gifted students at the end of the study. The convergent and divergent production dimensions in the gifted non-participants dropped significantly over time. Their classroom teachers reported that these students did not produce any work that they would consider 'gifted'. Although all the classroom teachers said the students were very capable, not one would consider the students could do the work completed in the "gifted program". When given the information that there had been no significant differentiation of abilities between the participants and non-participants, the classroom teachers did not believe that the (non-participating) students should be referred for special education programs. Although no teacher said the students were lazy, there were several euphemisms in the interviews that gave rise to our believing the students would be allowed to do the work in the special program if they were to complete the regular classwork first. The teachers had received professional development services in programming for gifted students, but did not seem to use this knowledge in their decision-making.

Conclusion

This study has shown inconsistency in the bases for which decisions are made in referral, identification, evaluating students' work, rating student achievement of program objectives; and understanding the elements and strategies that make up the program's components. It also has shown concretely, that students who need special intervention but who do not get it, may in fact regress. Such a regression is observed by teachers as behaviours inconsistent with their own perceptions of what a "gifted student" should be. Consequently, they will be unlikely to nominate these students in the future or refer them for external assessment that might allow the student a fair hearing at special education committee deliberations.

Even with inservice for the teachers, there is a need for clear understanding of program and student needs There is a need to find a process that would assess the consistent patterns found in the gifted students. There is a need to work with teachers in developing skills of evaluating students' abilities in the (non-academic) instructional objectives of these programs.

PROGRAM OBJECTIVES

PROGRAM'S STATED OBJECTIVES	SOI DIMENSIONS
1. Problem-solving - fact-finding; problem-finding; idea finding.	Cognition Convergent Production Divergent Production Semantics Units Relations Implications
2. Critical Thinking - observing; classifying; comparing; collecting & organizing information; hypothesing.	Cognition Evaluation Semantics Classes Implications
3. Divergent (creative) thinking - divergent questioning; quantity; viewpoint; involvement; conscious self-deceipt; forced fluency; flexibility; originality; solution-finding.	Divergent Production Semantics Relations Transformations Implications
4. Independent Study - writing; inquiry; oral communication; presentation skills & techniques; information gathering.	Cognition Evaluation Convergent Production Figural Content Semantics Classes Systems

Foci:

OPERATIONS: Cognition; Convergent Production.
CONTENT: Semantics
PRODUCTS: Implications

Gifted/LD Students: Assessing Individualized Learning Needs

Judy L. Lupart

Literature concerning the gifted/learning disabled (G/LD) began to emerge during the early 1980's, and since this time there has been a growing body of articles, books and journals on this topic. Despite the notable increase in the literature, most educators and administrators remain uninformed about this unique group of students and consequently, there is minimal support and programming intervention that is made available to these students. One of the foremost problems with this group is that their potential often remains hidden or invisible. Students will often become expert at utilizing their gifts to compensate for the disability areas, and as such, they can usually proceed through grade by grade without particular notice. Unfortunately, only those with severe learning disabilities will lag behind far enough to warrant further screening, and once identified, more often than not, the student is placed in a program for children with learning disabilities and the gifts are simply ignored.

This phenomena has also been noted in the literature. Hansford, Whitmore, Kraynak, and Wingenbach (1987) makes the point that in much of the existing literature, authors appear to adopt one area or the other and then make vague generalizations to include the other. If we expect to see any advance in the field of G/LD the separate areas of giftedness and learning disability must be synthesized into one area of exceptionality, with a separate and unique phenomenon.

Many authors have suggested reasons for the lack of such a synthesis (Hansford et.al.;1987; Whitmore, 1989; Yewchuk, 1986). Some of the primary issues include:

1) Lack of agreement on definitional aspects.
2) Lack of information, awareness and interaction.
3) Lack of research and demonstration facilities.
4) Lack of adequate identification measures.
5) Lack of adequate programming.
6) Socio-political problems.

Anyone who is familiar with the field would have difficulty denying any one of the issues listed above, and it should be emphasized that much more work needs to be done in all. It should also be noted that there may be considerable overlap among the issues, and that the resolution of one area might well provide some clarification for other areas. In the remaining part of this paper, I wish to make the point that the perspective one adopts toward solution of a problem area may well delimit the solutions one may ultimately find. In other words, the issues that are currently descriptive of the G/LD field may be more generally symptomatic of the need for paradigm shift. For the sake of brevity, I will limit my discussion to a focus on the issues associated with the identification of gifted/learning disabled students.

Issues Concerning Identification of G/LD

A brief overview of the literature reveals that there have been three general approaches to the identification of the G/LD student.

1) WISC-R or IQ Test Analysis - In this type of approach, protocals are broken down into their subtest scores and along with the verbal/performance scale discrepancies, are analyzed to discern any unique or unusual patterns that might typify the G/LD student. (Schiff, Kaufman, & Kaufman, 1981; Silverman, 1989).

2) Search for Characteristics - In this approach, groups of students labeled as G/LD are given various tests, or informal questionnaires and rating scales and key characteristics are determined. Alternatively, students representing the G/LD subgroup are compared with other LD and or gifted groups and the distinguishing characteristics are tallied. (Maker, 1977; Tannenbaum & Baldwin, 1983)

3) Taxonomic Classification - This relatively recent approach utilizes a case cluster analysis procedure to examine and classify numerous variables and test score results to identify subgroups of G/LD positioned according to the degree of severity of the learning problem, and the corresponding identified academic problems (Barton & Starnes, 1989).

Even though this type of work is helpful in certain aspects of the identification of G/LD students, some of the limitations of these three approaches are:

1) All of the traditional criticisms concerning standardized assessments and testing (i.e. validity, reliability, sampling, etc.) apply here.
2) The often reported problem of reading/spelling disability will continue to depress scores of G/LD on group IQ and achievement tests, and thereby keep their real potential hidden.
3) Characteristics listings are virtually identical to underachieving students.
4) These approaches are highly dependent upon labeling at a time when labeling is being actively discouraged in the schools.
5) The information has minimal relevance to instructional adaptations.

In addition to the above, it is most important to point out that virtually every discussion concerning G/LD focusses upon the identification aspects of assessment as opposed to the individual learning needs aspects. As a direct result of the one-sided concentration of concerns stemming from the gifted perspective, a potentially fruitful area of consideration has been almost entirely overlooked. The very fact that the richness of learning needs assessment and intervention that has pervaded the field of LD, has been mostly neglected in the G/LD literature, is perhaps the ultimate example of the lack of synthesis of the two fields. It is suggested here that the traditional perspective taken within the G/LD field needs to be reviewed and the development of a new paradigm for future work in this area is recommended. The following section of this paper will outline an in-depth assessment procedure which was utilized in the assessment of three G/LD students in junior high. Some of the unique features of the assessment approach are that it is

diagnostic, positive, developmental, student-centered, and is focussed on the learner in context.

New Paradigm Assessment of G/LD

In-depth assessment of learning abilities as well as learning disabilities needs to be carried out and synthesized into a multi-dimensional profile of the student. Since many of these students will have huge files with test results dating back to early grades, much of this can be summarized and noted on a multi-dimensional profile. However, it should also be noted that more often the test results are aimed toward diagnosis of a learning disability, and for this reason, it is important that there is a balance of measures showing both strength and weakness areas. The areas suggested for such a profile would include intelligence tests, achievement tests, creativity, self-concept, teacher evaluation, and family support. Taken together, this would constitute what I refer to as Stage One - Summary Profile assessment.

Stage Two - Learner-in-Context assessment incorporates recent thoery and research stemming from the cognitive development literature. For example the work of Ann Brown and her associates (Brown, Bransford, Ferrara, & Campione, 1983) over the past two decades has clearly shown that we need to be concerned with the interaction between variables that affect learning. The widely adopted Jenkins' (1979) tetrahedral model listing learning activities, characteristics of the learner, criterial tasks, and nature of the materials is a good example of such an organizational framework, and is used as a basis for stage two assessment. Moreover, Vygotsky's (1963) socio-historical theory suggests that it is essential to examine the mediational and/or social aspects of the learning context. Accordingly, stage two assessment procedures are geared toward the discernment of learning strengths and weaknesses as they emerge within the typical classroom environment, in interaction with the teacher or other students. Assessment materials should be similar to those used within the classroom. The student's own notebooks and texts are preferable. The basic format for this stage of assessment is the structured interview.

In the preliminary work with three G/LD junior high students, each was seen individually and the length of sessions ranged from two to two-and-one-half hours. The format and sequencing of the structured interview session varied with each student. A shared writing/response activity as well as a silent reading activity was carried out with each student. In addition, student notebooks, previous writing samples, and current texts and recreational reading materials were utilized throughout the sessions.

Since all three students had specific learning difficulties in the language arts area; writing and reading as well as program aspects were explored. The tetrahedral model was applied in the writing and reading areas using the four categories of person factors, task factors strategy factors and stance. Examples of questions used to assess writing and reading are as follows:

WRITING: Structured Interview Questions

I. Person Factors

1. Are you a good writer? What do these comments tell you about your writing ?

What do people say about your writing? (Students, Teacher, Parents)

2. Who is a good writer? How do you know?
3. What would you like to change about your writing? How could you improve your writing?
4. Do you write at home?
5. Why do people write?

II. Task Factors

1. What has to be in a good story? In a good essay? In your notes? In your journal?
2. You are going to write a story. Is there anything else you would like to know?

III. Strategy Factors

1. What do you do to help you write a good story?
2. If you have difficulty, what do you do?
3. If you knew someone was having difficulty writing a story how would you help them?
4. Are there any changes you would like to make?

IV. Stance

1. If you were to write something for yourself and something which will be posted on the bulletin board in your classroom, would you do anything different?
2. Here is the word _____. Show me how you would learn to spell the word.
3. Tell me about the kinds of writing you do at home.
4. You have written this story. How would you rate it on a scale of 1-10?

READING: Structured Interview Questions

I. Person Factors

1. What is reading?
2. Are you a good reader?
3. Who's a good reader? How do you know?
4. Do you read at home? Tell me how you read at home? What are you reading at home now?

II. Task Factors

1. I am going to have you read a story out loud, and when you are finished, I am going to have you retell me the story. Is there anything else you would like to know?
2. Why did you pick that book?

III. Strategy Factors
1. Was there any part of the story you didn't understand?
2. What do you do if you don't understand?
3. Did you try to guess what happened next in the story?
4. If you knew someone was having difficulty reading, how would you help them?
5. How do you think you can improve your reading?

IV. Stance
1. You read this story and you also read this passage about earthquakes. Do you think you read them differently?
2. Do you do anything different?
3. Which do you find easier? Why?

The program aspect covered the three categories of self-organization, class structure and personal response. Questions representing this area of focus were more generally geared to regulation aspects and the student's own perception of himself within the learning context, and some of the typical questions posed are listed below:

PROGRAM: Structured Interview Questions

I. Self Organization
1. How do you organize your schoolwork? Is there anything you could do to improve in this area?
2. How do you organize your time at school? Your study time at home?

II. Class Structure
1. What kind of a class is this? What is the purpose of this class?
3. Do you attend regular classes as well?
4. If you could change the way things are at school, what would you like to see?

III. Personal Response
1. Why do you go to this class? How will being in this class help you?
2. What do you like about school? What don't you like?
3. What can you do very well in school?
4. What do you experience the most difficulty with?
5. How is the family involved in your schoolwork? How is homework dealt with? How much? Where? When? Alone or with others?
6. How does the family view literacy?

All sessions were video-taped and all discussion was transcribed. Key segments were noted and organized within the tetrahedral framework, and recommendations regarding each student were summarized in individual education programs. Meetings were then scheduled to convey, confirm and validate the information with the teacher and parents. Specific instructional procedures were developed in collaboration with the teacher and parents and incorporated into the program.

In conclusion, a review of the issues in the G/LD field suggests that the area can be enriched

through a synthesis of the methods and procedures representing both areas. The specific area of identification was examined and the typical approaches were briefly outlined. It was suggested a new paradigm assessment approach would be more instructionally useful, and a two-stage model consisting of a "Summary Profile" and a "Learner in Context" component was described. The preliminary work that was carried out with three junior high school G/LD students suggests that this assessment model is particularly useful in assessing the individual learning needs of G/LD students.

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Meeting Students' Needs Through Individualized Instruction

Ed Marchand

Introduction:

This presentation looks at some of the unaddressed educational needs of secondary school level Gifted and Talented students, and then looks at how one high school - Bishop Carroll High School - meets the needs of these students through individualized education.

Needs of the Gifted and Talented Student

A five-year longitudinal study of Gifted and Talented (G&T) students who have graduated from Calgary area high schools indicated a certain amount of dissatisfaction with the ways their schools had met their special needs. At the same time these G&T students made some suggestions for improvement in schools.

The study indicated that G&T students want more:

- individualization
- flexibility
- enrichment
- personal development.

G&T students also want more help with their personal development to offset some of the negative traits particular to this group:

- alienation
- arrogance
- intolerance
- rebellion
- fear of failure
- coasting.

Unfortunately for G&T students the traditional high school has too many of the following characteristics:

- rigid programming
- large class sizes
- diverse abilities in class
- overemphasis on academics
- heavy workload demands
- diploma requirements
- anonymity.

Consequently the traditional high school tends to have some unfortunate outcomes for G&T students, including:

- no individualization
- no time to explore special interests
- inadequate personal development.

And after high school the G&T students go on to post-secondary institutions where they suffer from a variety of deficits, including:

- poor work/study skills
- poor independent learning skills
- poor self discipline
- poor motivation.

Introduction to Bishop Carroll High School

Bishop Carroll High School is one of the most progressive schools in North America. It has been in operation for almost twenty years and has graduated thousands of Alberta high school students who have never spent a day in a high school classroom. Yet these students generally have achieved high marks and have had a good development of their personal growth skills and responsibility. How is this possible and what can an individualized school do for gifted students?

What is so unique about Bishop Carroll High School?

Bishop Carroll High School is a school of the post-industrial age. It has broken out of the classic secondary educational mode of mass producing course completions using a standard process applied over a standard period of time. There are over 1,150 students at Bishop Carroll but no two of them are ever presented with the same teaching. Though the curriculum is generally the same for all, each student can learn it with his own appropriate combination of books, computers, videos, seminars, and personal consultations with teachers. Instead of learning only in front of a classroom teacher, at Bishop Carroll the student selects from the various learning tools to suit his needs.

So instead of studying a course in standard number of hours, the Bishop Carroll student spends as much or as little time as needed on the course.

Instead of stopping and starting course work on arbitrary dates, the Bishop Carroll student proceeds continuously year-round as it suits him.

Instead of learning as best he can in a fixed amount of time, the Bishop Carroll student masters each step of a course before he can move onto the next step.

Instead of being a passive recipient of knowledge presented by a teacher, the Bishop Carroll student is an active participant in his learning.

And instead of being little more than a numbered unit in a endless flood of students coming before a teacher, the Bishop Carroll student works under the supervision of a single Teacher-Advisor for his entire high school career.

What are the key elements of the Bishop Carroll system?
At Bishop Carroll all of the learning activities that a teacher would normally present in a classroom are packaged into booklets called Learning Guides. These Learning Guides describe the objectives the student must master as well as describe useful learning activities that enable the student to work through a course on his own.

The students work in a large rooms known as Resource Centres, with teachers and assistants providing assistance at the students' requests. The students control the time they spend in these Resource Centres, though they must all attend school daily on a regular basis within the parameters of their individual programs.

Students write tests in a common centre when they are confident that they know the objectives of a Learning Guide well enough to be tested on it. If a student is successful on a test, he will be awarded two or three progress units. 30 units are required for a course completion.

Seminars, A-V presentations, guest lectures, labs, and workshops on special topics take place daily in most courses. The student attends these activities as needed to master the objectives he is working on.

What kind of students attend Bishop Carroll?
Students from across Calgary come to Bishop Carroll. Some come because they are high achievers and want to finish high school in less than three years, or perhaps do it in three years and still handle a part-time job or heavy extra-curricular load. G&T students may

come for that reason or simply to experience the freedom to work independently or explore subjects in depth.

Some students choose Bishop Carroll because they want to slow down, master their work and finally get good marks. Most of these slower students gladly take three and a half or four years to graduate.

Bishop Carroll is also the high school where over 100 elite athletes, artists, models and musicians attend school on a very irregular basis while they pursue their activities.

Bishop Carroll also attracts many students who only want to spend a short period of time upgrading their high school marks, and who don't want to do that in an inconvenient or inflexible schedule.

The fact that so many different needs are met at Bishop Carroll shows the true value of a school which operates for the individual student.

What special tools are used at Bishop Carroll?

a. A personal advisor for each student.

Each student is supervised by one of the teachers, who is known as the student's Teacher-Advisor. The Advisor sees the student through from admission to graduation, giving an important personal dimension to a large urban high school. Teaching the student the attitudes and skills to develop individual responsibility, as well as monitoring the student's daily progress is an important part of the Teacher-Advisor's job at Bishop Carroll.

b. A data base.

Each student's progress is monitored continuously. This requires all 15 subject area Resource Centres to update the progress of 1,100 students every day. In turn this ur . count must be examined and recorded daily by all 45 Teacher-Advisors and the 25 students of which each Advisor is in charge.

c. A packaging process for each course.

At Bishop Carroll each teacher must be a writer. Overall, hundreds of Learning Guides have been written to present the learning activities for over 100 courses. These Learning Guides are all prepared on computers and are being updated and improved constantly by the teachers.

d. A special track for high achievers
Students who find the regular Learning Guides to lack challenge for them, and who prove it with goods marks, can ask for ALPHA Learning Guides which are intended to provide activities which are more enriched and sometimes even unique to a particular student. However, the student does not have to stay in the ALPHA permanently and can switch back and forth between regular and enriched work as desired.

Where is Bishop Carroll going in the future?
Bishop Carroll High School has developed and maintained its unique and successful educational system for the past two decades - a period which saw several swings in the general nature of education. Bishop Carroll's philosophy of individualized education was steadfast throughout that period and will continue into the future. Indeed it is likely that the Bishop Carroll model will be used more and more in the schools of the future.

Conclusion:
As we look at the needs of G&T students we can see that many of their needs can be met at Bishop Carroll including flexibility in their high school programming, assistance with their personal development, and preparation for educational life after high school.

Administrative Provisions for the Gifted and Talented

Garnet Millar

Presentation Outline

Introduction
Garnet Millar
Education Response Centre

In order to better understand the initiatives undertaken by Alberta Education, a brief overview of the history of special education in Alberta is necessary with particular emphasis on the gifted and talented. A context will, therefore, be provided for the presentations made by the various branches of Alberta Education.

A. History of Special Education in Alberta	Transparency No.
• 1905 - 1932	# 1,2
• 1960's	# 3
• 1970's	# 4
• Types of Special Education Classes in Alberta 1920 to 1979	# 5

B. Provision for Gifted and Talented in Alberta School (1980's)

• Stimulus (CEA, Alberta Education Survey, Curriculum Conference)	# 6,7
• Task Force on Education of the Gifted and Talented (1982)	# 8
• Recommendations of Task Force (1983)	# 9
• School Act (1988) - Provision for Gifted s. 29 (1) (2) (3)	# 10
• Policy on Special Education	# 11

- Funding of Programs for Gifted and Talented: Special Education Block Grant ($181 per resident student)

Conclusion

With this information as background, various initiations from Alberta Education will be presented.

Copies of the overheads can be obtained through the Centre for Gifted Education.
Ask for *SAGE Conference 1990 - Speakers' File*

Recognizing Corrections: Alberta Education Initiatives - Implications for the Education of the Gifted and Talented

Garnet Millar

Presentation Outline

Garnet Millar
Education Response Centre

Introduction

A number of initiatives have been undertaken by the former Special Educational Services Branch and by the Education Response Centre since the Task Force Report "Educating Gifted and Talented Pupils in Alberta" was released in 1983. These initiatives will be briefly described.

	Transparency No.
A. Development of a Resource Manual for Teachers	
• Educating Gifted and Talented Students in Alberta (1986)	# 1
• Chapter One - Overview	# 2
• Chapter Two - Planning a Program/Service	# 3
• Chapter Three - Identification	# 4
• Chapter Four - Program/Services	# 5
• Chapter Five - Evaluation	# 6
• Appendices	# 7
B. Inservice Package for Teachers	# 8
C. Videotape Series on Serving the Gifted and Talented	# 9

D. Handbook of Instructional Materials for the Education of the Gifted and Talented # 10

E. Directory of Programs and Services for the Gifted and Talented in Alberta (1987) # 11

- Format of Directory # 12

F. Incidence of Exceptional Students in Alberta # 13

- Purpose # 14
- Return Rate # 15
- Exceptional Students in the School Context # 16
- 9.7% # 18,19
- 2.5% of Alberta Students are served in Gifted Programs # 20,21
- Gifted is Now an Important Component of Exceptional Students in Alberta # 22

G. Development of Enrichment Units - Country of Parkland # 23,24

Conclusion

The ERC has moved from providing guidelines for the development of gifted programs to providing practical materials that teachers can readily use in the classroom. It is our hope that we will continue to assist teachers in making schooling meaningful for gifted and talented students.

Copies of the overheads can be obtained through the Centre for Gifted Education.
Ask for *SAGE Conference 1990 - Speakers' File*

Focus on Research

Teddy Moline

Focus on Research: A Guide to Developing Students' Research Skills is a monograph which guides teacers in the implementation of resource-based research with their students.

BACKGROUND

Focus on Learning: An Integrated Program Model for Alberta School Libraries was published in 1985, and is still being implemented. Jurisdictions have requested more guidance in implementing the instructional component of this model, and to accommodate this need, *Focus on Research* was developed. Integrating research skills and strategies into Programs of Study and Teacher Resource Manuals is one way of promoting the development of students' ability to comprehend, analyze, synthesize, and apply information. However, until all subject area documents are revised and drafted, and incorporate research skills as appropriate, this monograph provides assistance in developing students' research skills and strategies.

After extensive input from teachers and Alberta Education staff, the first draft of *Focus on Research* was distributed in March 1989. Over 350 individual responses were received, plus numerous collective responses. Revisions to the document continmued over the summer of 1989 and every effort was made to incorporate the suggestions from the first draft. After a second favourable review and rewriting, the document was finalized in March. This document was distributed to all schools in April.

PURPOSE OF THE MONOGRAPH

Students in this generation are faced with a more bewildering array of information than has previously existed - for both the quality and quantity of information have changed. Developing the skills and strategies to deal effectively with information will prepare students to function fully incociety and will contribute to their appreciation of learning as a lifelong process. The underlying philosophy of *Focus on Research* is based on research that shows students must make connections and see relationships between what they read, see or hear and what they know before inforamtion can become personal knowledge. This document presents a comprehensive research process: the skills and trategies that students learn can be applied in any subject area and can be transferred to all types of curriculum-based research e.g., historical, empirical, action, etc. and to many situations in everyday life.

The Continuum of Research Skills and Strategies

The continuum of research skills and strategies presents five stages through which students progress during a research activity. In part the terms used to describe the five stages in this research model, are derived from *Focus on Learning*:

Stage 1 : Planning - preparing for research;
Stage 2 : Information Retrieval - gathering information;
Stage 3 : Information Processing - synthesizing, analyzing, and evaluating information;
Stage 4 : Information Sharing - presenting the final product; and
Stage 5 : Evaluation - reflecting on the complete process and identifying changes and transferable situations.

Each stage is composed of skills and strategies which students need to efficiently handle information. The continuum is cumulative and students acquire expanded skills and strategies while working through the stages. However, teachers may choose to focus on only one aspect of the research stages or skills for a particular activity, and that there may be considerable movement back and forth amongst the stages, depending on the activity.

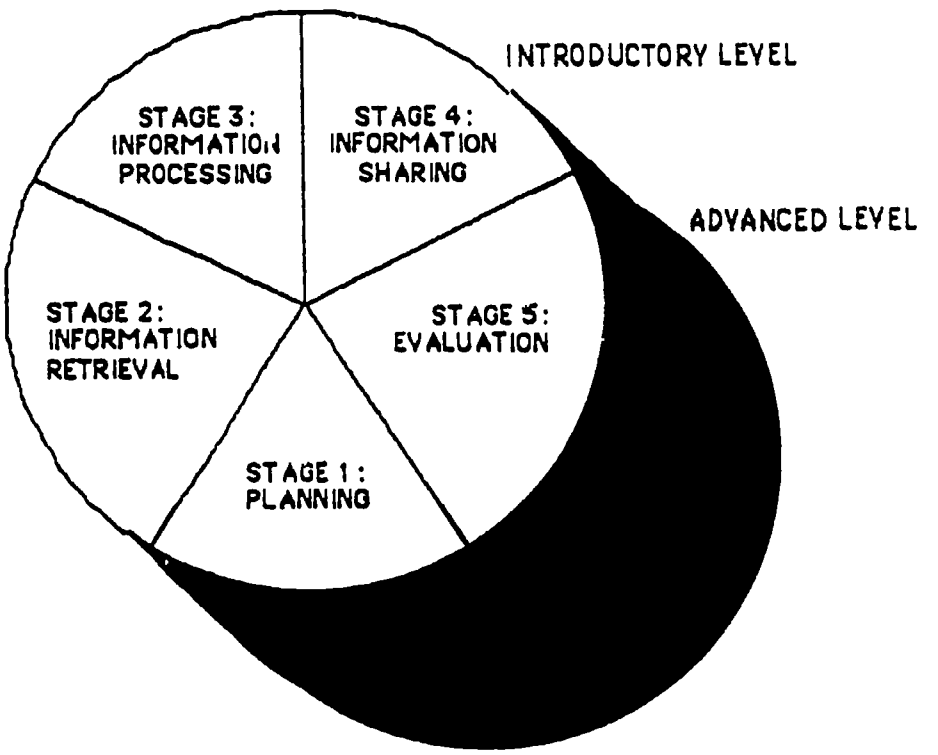
STAGES	SKILLS
Planning	• Establish Topic • Identify Information Sources • Identify Audience and Presentation Format • Establish Evaluation Criteria • Review Process
Information Retrieval	• Locate Resources • Collect Resources • Review Process
Information Processing	• Choose Relevant Information • Evaluate Information • Organize and Record Information • Make Connections and Inferences • Create Product • Revise and Edit • Review Process
Information Sharing	• Present Findings • Demonstrate Appropriate Audience Behaviour • Review Process
Evaluation	• Evaluate Product • Evaluate Research Procedures and Skills • Review Process

Figure 4: An Overview of The Research Skills Continuum
See Appendix for copy-ready form.

The Continuum of Levels of Research

The continuum of levels of research, introductory to advanced, indicates that students will progress, as they experience more research activities, from teacher directed (dependent) learning to student directed (independent) learning.

The two ends of the research level continuum, introductory to advanced, are not grade-labelled. Students of any age may attain the skills and strategies identified in the introductory or advanced level with only the level of complexity differing as the student progresses through school.



The continuum of Research Stages and the Continuum of Research Levels.

Teacher Planning

The role of the teacher and teacher-librarian in this research model is as facilitator-model. Information is also provided for teachers who are considering integrating research into their curriculum for the first time.

CONCLUSION

This document advocates the importance of students developing critical thinking skills, and a generic research process. Many more resources from other sources for and on the topic of a research process and thinking skills are available. Teachers, as lifelong learners, may find this document leads them to other sources which also promote the development of students as truly independent learners.

IMPLEMENTATION

Provincial

One-day awareness sessions will be offered in each of the six zones in the fall, 1990. The regional media and technology consultants (see below) will invite each jurisdiction to send 1 - 2 lead personnel, who will be responsible for further orientations in their district. Larger jurisdictions, regional library systems, ATA conventions, and specialist councils may wish to offer special inservices on this topic.

School

The most effective approach to developing students' research skills and strategies, is for schools to develop a research plan which meets the needs of their students, resources, and staff. Ideally, leaders attending the awareness sessions will work with schools in developing their own research plan for students, and will assist in determining which specific skills and strategies they feel are appropriate to their situation. These skills and strategies are never internalized when they are taught in isolation, but only when they are integrated with the curriculum.

Focus on Research identifies a few selected references to research from Programs of Study to be used as starting points for schools when developing their own research skills continuum. Schools, however, will be able to identify far more references than there was room to list in this document.

Developing and implementing a research skills continuum and research activities works efficiently when teachers cooperatively plan with a teacher-librarian. it is recommended that in cases where a teacher-librarian is unavailable due to low enrollment, that a cooperatively planned research project can be worked out between classroom teachers.

ALBERTA EDUCATION

Focus on Research:
A Guide to Developing Students' Research Skills
#OXS 0-1016
$3.75

From
Learning Resources Distributing Centre
12360 - 142 Street
Edmonton, Alberta
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A Developmental View of Young Gifted Artists

Marion Porath

The approach used to study artistic giftedness combines two perspectives:

1. Stages of development in different domains. This emphasizes the constants in development and the characteristic way children think at different ages. This perspective is more global, focusing on the "forest," or "big picture" of development (Case, 1985; Dennis, 1987; McKeough, 1986).

2. Field-specific approach (Gardner, 1983) which emphasizes specific abilities, or the "trees" of development. These abilities constitute the richness and detail which are added to the "big picture" and which are believed to differentiate gifted children from the norm (Porath, in press).

Rationale:

- Increased recognition of domain-specific achievement (vs. "general disposition").
- More attention should be given to discipline-specific knowledge and skills.
- Excellence in a given field of accomplishment may offer a better basis for selecting individuals for educational benefits than testing for general intelligence or creativity (Wallach, 1985).
- Field-specific instruction is crucial:
  - Feldman - Prodigies
  - Stanley - Gifted mathematicians
  - Bloom - Highly accomplished pianists, swimmers, research mathematicians.
- More research needed on the pre-adolescence period.

STAGES IN DRAWING DEVELOPMENT (Dennis, 1987)

AGE	
4	Understands and draws figures consisting of several parts, e.g. humans, trees, flowers (Fig. 1).
6	Puts 2 or more objects on a single baseline. Simple "scene" results (Fig. 2).
8	Objects placed with regard to 2 scenes - fore-ground and back-ground (Fig. 3).
10	Foreground and background scenes related via a middle ground. Coherent 3-dimensional scene with clear and continuous appearance of depth (Fig. 4).
12	Multiple scenes with point of view constraints (Fig. 5).

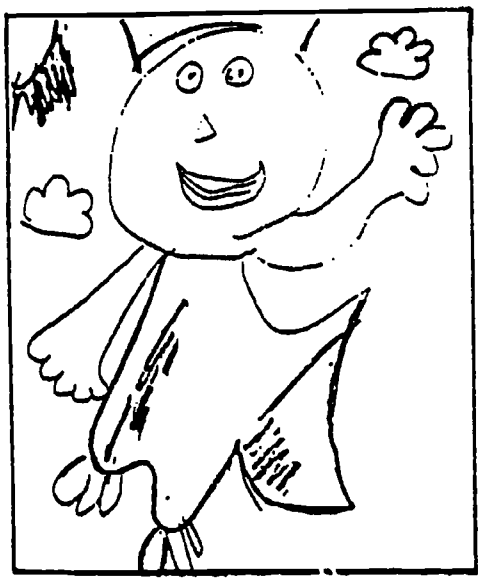


Figure 1

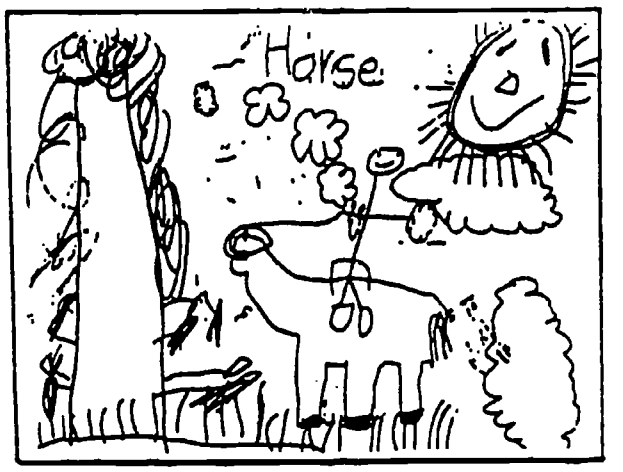


Figure 2

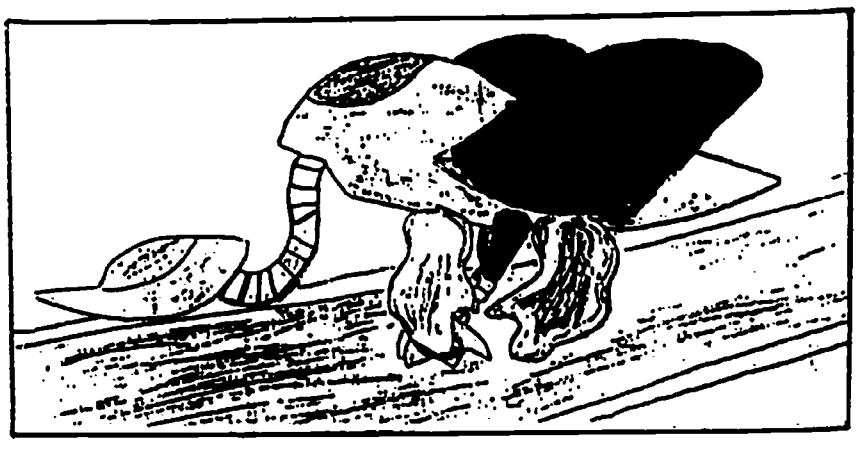


Figure 3

Figure 4

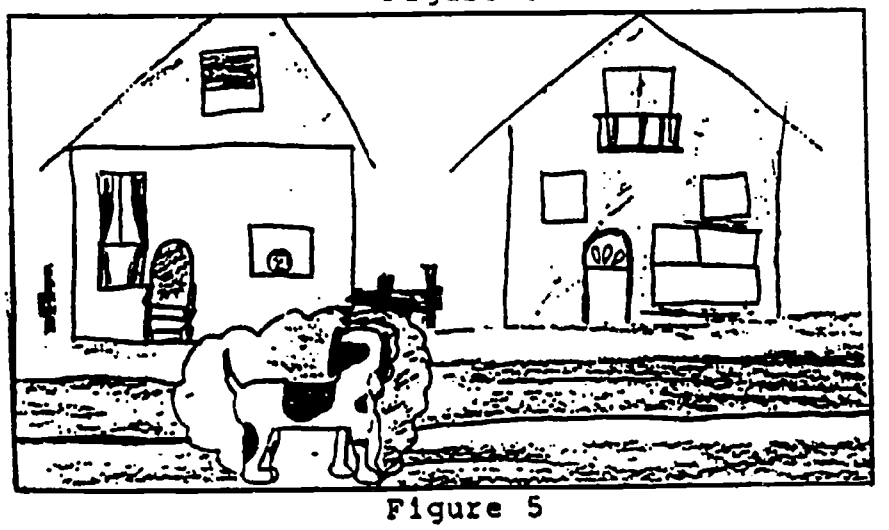
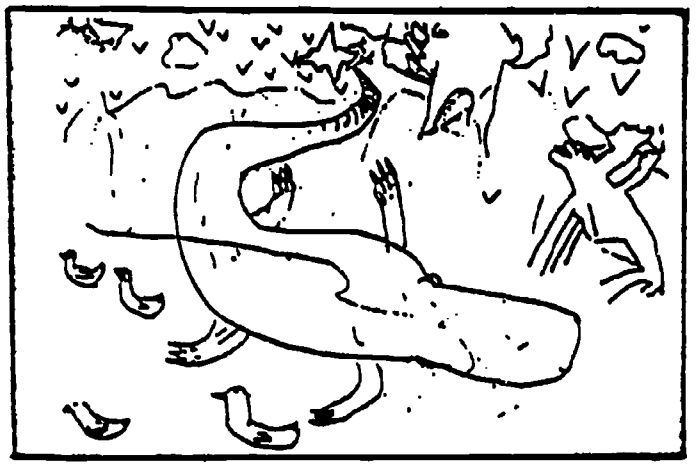
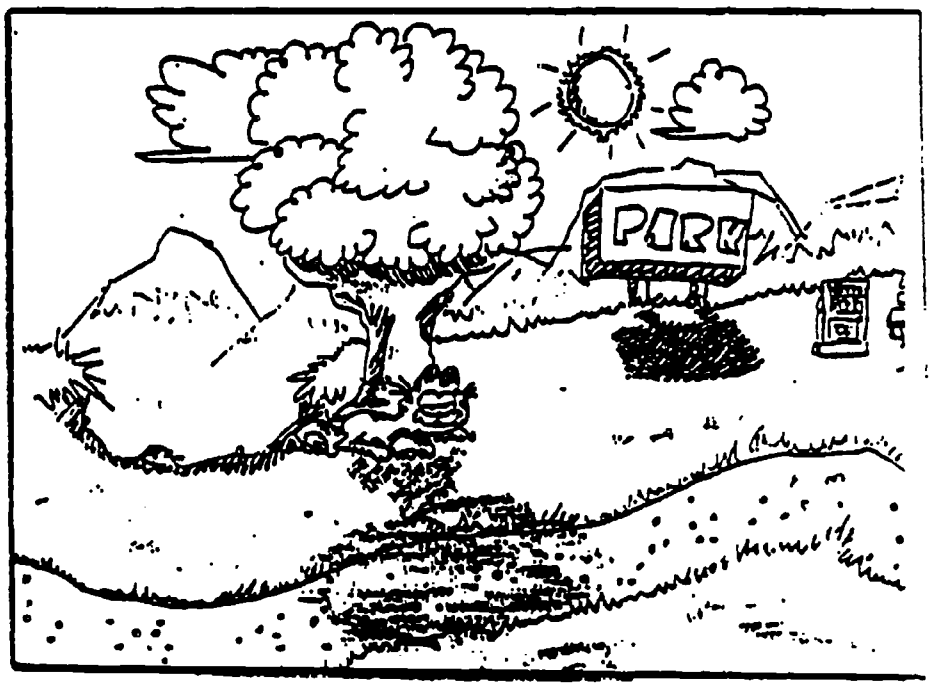


Figure 5

Artistically gifted children attain the stages of drawing development at approximately the same ages as other children. Where they excel are in such things as skill in drawing human figures and animals (e.g. proportion, detail), dramatic composition, style, technique, and elaboration of picture components.

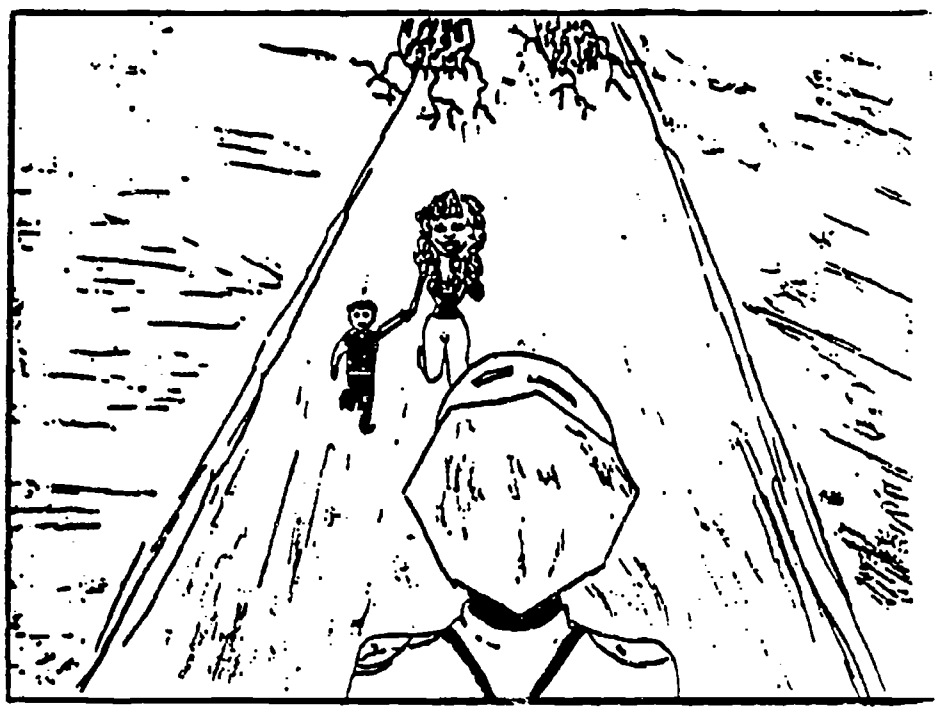


Age: 5



Age: 10

Age: 8



Age: 11

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Under the Gifted Umbrella: The G.A.T.E.S. Program

Peter Prest

Introduction

At Sir Winston Churchill we are entering into our fourth year with the G.A.T.E.S. program, and each year that program has changed. What I'd like to do this morning is describe the basic framework or the ribs of our particular umbrella, the background planning, the changes which have gone on over the past four years, and end with what we're doing currently. In doing so I'll try and point out what I consider to be the strengths of the program along with its weaknesses, ideas we'd like to come back to and ones we'd just as soon forget. Most of all, I'd like to let you in on the creative thinking, foresight, imagination and trust which seem to me to surround this unusual gifted and talented program on all sides.

G.A.T.E.S. is an acronym for Gifted and Talented Educational Support and was suggested by Glen Holmes, then a consultant with EAS-G, the CBE's short-lived gifted education support service. By selecting this name we deliberately tried to implant the idea of *enabling* and *providing opportunities* for both our students and our colleagues, but not of taking on the role of 'gifted instruction' in the school. We are not the 'gifted teachers'; whether they like it or not any teachers who work with these students are 'gifted teachers' and we see our role as being one of broadening the base of gifted instruction in the school through our persistent and focused support.

Our Origins

Sir Winston Churchill is a large urban school with a population which hovers just above the 1700 mark. Prior to G.A.T.E.S. the school assumed that its IB program, along with Performing Arts and other enrichment programs provided significant and sufficient educational opportunities for our gifted and talented population. We are the first school in Alberta to offer the IB program and our students have continuously demonstrated their high academic abilities here in both the humanities and sciences. The Performing Arts option and our strong Fine Arts program offer artistically talented students a wide range to choose from. Did we really need a gifted program on top of all this? Wouldn't such a program really be superfluous?

These were some of the questions in my mind when I approached then-principal, Terry Allen, about forming a committee to examine the potential need for a special gifted education program at Churchill. Terry not only encouraged me to form such a committee but he gave us an open-ended time frame to

examine the need and if necessary, develop a program to meet that need.

The resulting committee was in fact a very large one. There was representation on it from all departments in the school as well as the EAS-G team from ELC I - about 18 people when we all sat around the table. And it became clear from talking with these people, that they were there because they already had a definite interest in gifted education. We began with a simple but essential question for any group to start with...'who needs us?' Very quickly it became evident that there were in fact three identifiable student groups that did need support in the school - the gifted underachievers, the passionate learners and our incoming Grade 10 students who had already been involved in programs at their respective junior high schools. These were students who weren't necessarily going to be picked up in our existing enrichment programs and who deserved our immediate attention.

That narrowing of our focus happened in our first few meetings. It took us the remainder of the year to develop a program which would meet such a diverse set of needs. During that time, thanks again to EAS-G, we were able as a committee to be freed from the school for two half days to meet, review the existing literature, review existing programs in the system and elsewhere, and to plan our own. The leg work for this large committee was carried out by a smaller steering committee of eight members.

Two problems confronted us immediately. The first one was that most schools had adopted existing or packaged programs developed by others for insertion into their school timetable. It was our feeling that such a policy tended to isolate those students selected from their peers which we felt was undesirable. It also perpetuated the concept of the 'gifted teacher' who looked after gifted instruction leaving the remainder of the staff free to concentrate on regular instruction. Again, we didn't feel that was a desirable approach - for any of our students or teachers. Surely there was a way to incorporate some of the approaches used for teaching gifted students into the regular classroom, and just as surely there were as many students who could benefit from those approaches outside of our program as there were in.

The second problem was equally as frustrating for us. There was almost no documentation in the literature of programs working with gifted underachievers, one of our initial target groups. What little literature we did find didn't seem too optimistic about our chances for success with this group. Underachievers were difficult to motivate; gifted underachievers were even moreso, since they saw the motivation coming long before their peers, and had plenty of time to duck.

We did find a lot on mentorship programs for our 'passion' students and we did find a number of programs which seemed to match the needs of our incoming Grade 10 gifted population. The one we felt most comfortable with was George Betts' *Autonomous Learner Model* since it operated on discovery and self-directed learning, tying in very well with our own aims and beliefs about education.

We also felt more comfortable with Don Treffinger's approach (1985) to gifted education generally. He had talked of developing a 'talent pool' using the broadest measurements possible for inclusion into the program, and adopting what he referred to as the IPPM approach (*individualized, programming, planning, model*). The importance here was the process involved, not the entity of the program; a framework for making decisions, not prescribing learning structures.

In the end we felt it necessary to develop an umbrella approach - one program with three separate but interlocking foci. We hoped by approaching the problem in this way that we could reach a large number of students, providing for both their immediate and longterm needs. We wanted it to be possible, for instance, for a student to enter into our program as an incoming gifted student and progress through to a mentorship opportunity in the senior grades. We also wanted our underachieving gifted population to have the same opportunities open to them. At the end of 5 years of operation, I'm proud to say that these our still important goals for us, and disappointed to say, that in the case of gifted underachievers, that goal still eludes us.

Evolution of Our Policies

We had long and complex debates and schemes for admission into the program, awarding credits and finding time, space and teaching personnel. In the end we proceeded with the simplest approach to each. Early on we had hoped for far more significant testing by the EAS-G psychologist, Janet McKenzie, but her workload and the subsequent demise of EAS-G made this sort of clinical assessment impossible. Instead, inclusion in Focus I (underachievers) would be based on a review of the existing grade 10 Otis Lennon scores. All grade 10 students took the test and we felt a score in the 95th percentile or better would bring a candidate initially to our attention. If the students' corresponding academic scores were less than 70 percent overall and if a check with teachers and counsellors didn't turn up any extenuating circumstances, then these students would be invited to join us in G.A.T.E.S. Focus I. Their parents would be notified by mail and would attend a special information evening with their sons and daughters where the program, such as it was, would be laid out for them. Students could only be admitted to the program on their own request. No parent volunteering.

We looked to both teacher and student referrals to fill G.A.T.E.S. Focus II, our mentorship program. Teachers of grade 11 and 12 students were asked to recommend students for inclusion in the program which carried the potential for 3 or 5 credits. We also invited students to refer themselves and have been surprised at the number and variety of responses over the intervening years. Our Focus II facilitator checks these against the students academic record, especially in the field of indicated interest, and then begins the search for mentors. Project evaluation and the awarding of credits are in the joined hands of the mentor and facilitator.

Inclusion in the third sector, G.A.T.E.S. Focus III is based on recommendations from our feeder junior highs. We accept their suggested list each spring and contact these students once they are securely housed in Churchill in the fall. This program has operated on a quasi-club status until this year, when the question of credits has again been reviewed.

Setting Up

Finding time to offer this program has again taxed our ingenuity. Given our concerns about the exclusivity and isolation of a timetabled program, it seems hardly surprising that we opted to explore ways of incorporating our program into the school framework without pushing something else out. We accomplished this in a different manner for each focus. Focus I students met with their facilitator on a regular basis either in a group or singly. Since the facilitator was also the Resource Teacher for the first two years and Guidance Department Head for the third, this process was accomplished through referrals to classroom teachers and noonhour meetings. For Focus II students, noonhours and after school were the times to meet with the facilitator, but meeting and working with mentors did require that we at least try to find release time from some of their classes to work with the mentor off campus. For Focus III students, noonhours did not seem to be an effective time period so their facilitator devised a modified pullout timetable taking each student out of each course in his/her grade 10 year for 2 periods. This gave him 16 periods over the year to base his program on, and this plus special noon and after school session proved to be adequate.

Teacher preparation time? When we approached the school with our proposed program, they were very receptive and supportive about the idea provided that no extra time would be allotted to the teacher(s) to run the program. Their concerns were understandable since requests for extra time are always being made to every high school administration, and each period freed up means higher class loads overall. We accepted the proviso, and developed the idea of a instructional team of 4 - one director and three facilitators - none of whom were to

receive extra time for their efforts but all of whom were to have this become their major extracurricular assignment. An additional effort was made to timetable a common preparation for each one to facilitate planning and developing the program. We have been able to provide this common preparation period up to this present year when unfortunately, it evaporated.

The Seed Project

It was further decided that the first year, 1986-87, would be a Seed Project to allow us to monitor and evaluate the overall program. A total of 7 students were selected for Focus I, 4 for Focus II mentorships and about 12 students stayed with Focus III for the year. This allowed us to get a feeling for the total program and its individual parts before we plunged in.

At the end of that year we assessed the program using a modified version of the Department of Education Assessment Instrument along with some assessment materials which we borrowed from Dr. E.P. Scarlett's P.A.C.T. program. The results of the assessment proved encouraging from all three groups polled - students, parents and teachers, although we discovered that the teaching staff had become out of touch with the program generally. We have attempted to remedy that situation by making more use of the Gifted and Talented Steering Committee, a group which acts both as a monitoring and informational agency between our program and the school at large.

Evolution of a Program: Focus I

The goals and ideals which were present when we founded G.A.T.E.S. are still very much in evidence four years later but much has changed in the actual operation. We still believe that our program operates best as a support program and every attempt is made to leave students in their regular classes with their regular teachers. In Focus I we have made perhaps the most dramatic innovations, since this is an area which most other programs avoid. We began by seeing the *Resource Group* as our base of operations. We felt that if all the teachers of a particular student got together on a regular basis with or without the student being present, that we could develop a *game plan* for that student which would be the best for him/her. In fact we scrapped the idea after going through the process once. It was cumbersome, time consuming and for the teachers involved, irritating and lacking in proportion (7 students deserve this much of our time, energy and attention!). Instead the Focus I facilitator, Diana Gibbons, began to work with the students alone, and it soon became apparent to her that problems with self image were at the base of most of our underachievers' lacklustre performance. While this discovery came as no

surprise to any of us, it did allow Diana a base of operation. She began working with them on their sense of self worth. She also discovered that these students had less in common with each other than we might have originally assumed. What they wanted was more individual time with Diana and an assurance from us that their involvement in the program would be a confidential matter. We have followed this latter request each year, reviewing the student's involvement in Focus I only when the situation seemed to warrant it with a particular teacher, and then only with the student's prior agreement.

This was really the approach we used, with moderate degrees of success, until last year when Diana left the program and we asked Dan Richards, our Guidance Department Head to take over facilitating Focus I, with his department members equally sharing the students in the program. The 9 students in the program met on a regular basis with their counsellors and progress reports were shared at regular Guidance meetings. While in a very important way, the students felt comfortable in this situation, the whole program seemed to Dan to lack the focus and cohesion that it had under one facilitator.

This year we have one individual acting as facilitator again. Ron Cole has moved over from Focus II to Focus I and is currently setting up this year's program. We intend to try another innovation for the underachieving gifted, in-school mentorships. Since our students respond so well to the individual attention of one concerned adult, we hope that if they select that in-school mentor and that mentor agrees to the partnership, that some very exciting changes may occur. This was an idea which came from our Steering Committee which continues to monitor and support the G.A.T.E.S. program. Ron will continue to work with the group and oversee the mentoring relationship to make sure it is both effective and sustaining.

Evolution of a Program: Focus II

Focus II has remained relatively stable since its inception. Our first Facilitator, Ron Cole, set up the necessary structures to find appropriate candidates, check on their credentials, locate mentors, set up initial project meetings, monitor progress and assess results. Fortunately for us, Ron has been very organized, very persistent and very committed to our talented students and the program. Over the last three years Ron has arranged for an amazing 40 mentorships, everything from competitive skiing to wood carving, from eye surgery to TV journalism, from genetic engineering to photo-journalism, from writing poetry to making corporate decisions. Each candidate has posed Ron with the difficult problem of finding a mentor in that particular area, but more often than not he has been successful in finding not only

someone with the necessary training but also someone with the right attitude to help our students. Overall our Focus II has been very successful, so successful that we found some students saw it as a prestige program, one where all the effort went into being accepted. We have since made minor revisions in our selection procedures which we hope will help us better assess students' reasons for applying. Our current Facilitator is Vic Peterson who has maintained an active interest in the program throughout, having served actively on the original committee and maintained a commitment to the Steering Committee which continues to act as our monitoring and communicating agency.

Evolution of a Program: Focus III

Focus III has taken the longest to gel in one sense. We began this focus, not with the urgency of Focus I or the idealism of Focus II, but rather with the idea of a social grouping with a strong intellectual component. To this end our Facilitator, Paul Thunberg, has had to create a program to meet a wide variety of needs but without the support of a definite curriculum or a definite time period. We were initially drawn to George Betts' *Autonomous Learner* model and we are indebted to the P.A.C.T. program team at Dr. E.P. Scarlett for sharing their approaches and helping us to form a Bettsian type of program for our grade 10 gifted population. Paul has modified the original program to meet more closely with our needs and the time frame available, but we have enjoyed putting on the *Night of the Notables* in June where students and Facilitators come dressed as personages from history or current affairs, becoming that person for an evening. Our Focus II students act as hosts and also take the opportunity to explain to an audience of interested parents, peers and teachers what their mentorships have been about. *The Night of the Notables* has been the highlight of the Focus III program each year it has been offered.

Even with its obvious success, we were concerned that our Focus III didn't offer students a strong enough opportunity to develop their thinking skills. This year we have added *Odyssey of the Mind* to the Focus III program, with the idea that through this activity, we will be better able to challenge our students' intellectual needs and interests. In order to take on what is to all intents, a full program as part of our existing program, Paul has enlisted the assistance of another interested and committed staff member, Kathryn Lemmon, as a Co-Facilitator, and we look forward to Focus III's entrance into this new and exciting adventure.

Summary

As you can see the G.A.T.E.S. program has hardly stood still over the last three years, but our program aims are still essentially the same - to provide educational support for our

gifted and talented population and for our entire staff as they work with them daily. Our program has not reached the 'refining' stage yet, simply because we are not ever completely satisfied with what we see in front of us. I am very proud of what we have achieved, and yet, this whole question of educating gifted and talented always seems to prompt more questions than solutions. It is these questions which continue to motivate and direct us as our program evolves.

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Using the Discrepancy Evaluation Model To Energize Programs for Gifted

Michael Pyryt

Introduction

The purpose of this paper is to use the Provus (1969, 1971) *Discrepancy Evaluation Model* to design programs for the gifted and evaluate their effectiveness. Evaluation is accomplished by: agreeing upon program standards; determining whether a discrepancy exists between some aspect of the program and the standards governing that aspect of the program; and using the discrepancy information to identify areas that need to be improved. A pictorial representation of the *Discrepancy Evaluation Model* is shown in Figure 1. The analysis takes place through four developmental stages:

1. Definition (This stage is also known as the Design Phase).
2. Installation
3. Process
4. Product

Once the developmental phases are accomplished, a Cost-Benefit Analysis can be performed.

The evaluator in conjunction with program staff attempts to ensure that there is consensus among program staff regarding the program components. It should be noted that the process of program definition using the discrepancy approach is a dynamic one since decisions regarding any components affect other components. Although the outcome of program definition using the discrepancy model appears linear, the process is non-linear.

Definition

The major consideration in terms of discrepancy evaluation during the definition phase is determining whether or not the following program definition components have been conceptualized:

1. description of client population
2. description of staff
3. terminal objectives
4. enabling objectives
5. sequencing of enabling objectives and learning activities
6. characteristics and entry behaviors of clients
7. description of administrative support requirements
8. description of staff functions
9. time frame

The following sections highlight the definitional issues that must be resolved in order to have a *"Program for Gifted Students"* instead of a random collection of activities.

Description of Clients

There needs to be agreement on whether the program is going to deal with all six areas of giftedness (general intellectual ability, specific academic aptitude, creative thinking, visual and performing arts, and psychomotor) or a selective area such as mathematical reasoning ability. There also needs to be agreement regarding the grade levels that the program will encompass.

Description of Staff

There needs to be a description of the staff that is needed to successfully implement the program including a specification of what qualifications each staff member should possess.

Terminal Objectives

There must be statements of final outcomes that students will achieve as a result of program participation. For example, when faced with new challenges, the student will apply the creative problem-solving process.

Enabling Objectives

There must be a statement of intermediate outcomes that are steps to achieving terminal objectives. For example, the student will be able to brainstorm criteria to judge ideas.

Sequencing of Enabling Objectives and Learning Activities

Learning activities and enabling objectives need to be sequenced. The *Creative Problem-Solving* process involves mess-finding, fact-finding, problem-finding, idea-finding, solution-finding and acceptance-finding. A teacher might use activities from *CPS for Kids* (Eberle & Stanish, 1980) to accomplish each sequential enabling objective.

Characteristics and Entry Behavior of Clients

There must be a description of what characteristics gifted students bring to program. Much thought needs to be given to expected cognitive aptitudes, content knowledge, motivational level of students, learning styles, and capability for self-directed learning.

Description of Administrative Support Requirements

There must be a description of the resources needed to carry out the program. These might include classroom space, storage, filing cabinets, computers, classroom supplies, learning materials, and psychoeducational tests.

Description of Staff Function

There must be a clear delineation of roles and responsibilities of all staff involved. This statement is critical in programs that rely on integrating the gifted children in the regular classroom.

Time Frame

There should be an assessment of how much time it will take to accomplish enabling and terminal objectives.

Installation

This stage addresses the question of whether or not implementation of the gifted program is congruent with the specifications developed during the program definition stage.

Process

This stage addresses the extent to which the enabling objectives are being met. Teacher evaluation of student progress, work samples, classroom observation, and student projects, might be used to document accomplishment of enabling objectives.

Product

This stage addresses the extent to which the terminal objectives are achieved. Having a student apply the creative problem-solving process to a new problem would provide evidence of a student's creative problem-solving capabilities. In Alberta, documentation of achievement of long-term objectives of each student's *Individual Program Plan* could be used to provide data during the Product Stage.

Cost-Benefit Analysis

Once a gifted program model has achieved success in accomplishing terminal objectives, then it becomes possible to evaluate whether the presumed benefit of the program is accomplished in a cost effective manner. This is accomplished by comparing the gains and operating costs of the program with gains and costs of alternative program models.

Summary

This paper highlights the components of the *Discrepancy Evaluation Model*. The major benefit of this generic evaluation model is that the model requires clear specification of program goals, staff function, curriculum, and administrative support requirements before the program is implemented. Such thoughtful planning is the key to energizing programs for the gifted.

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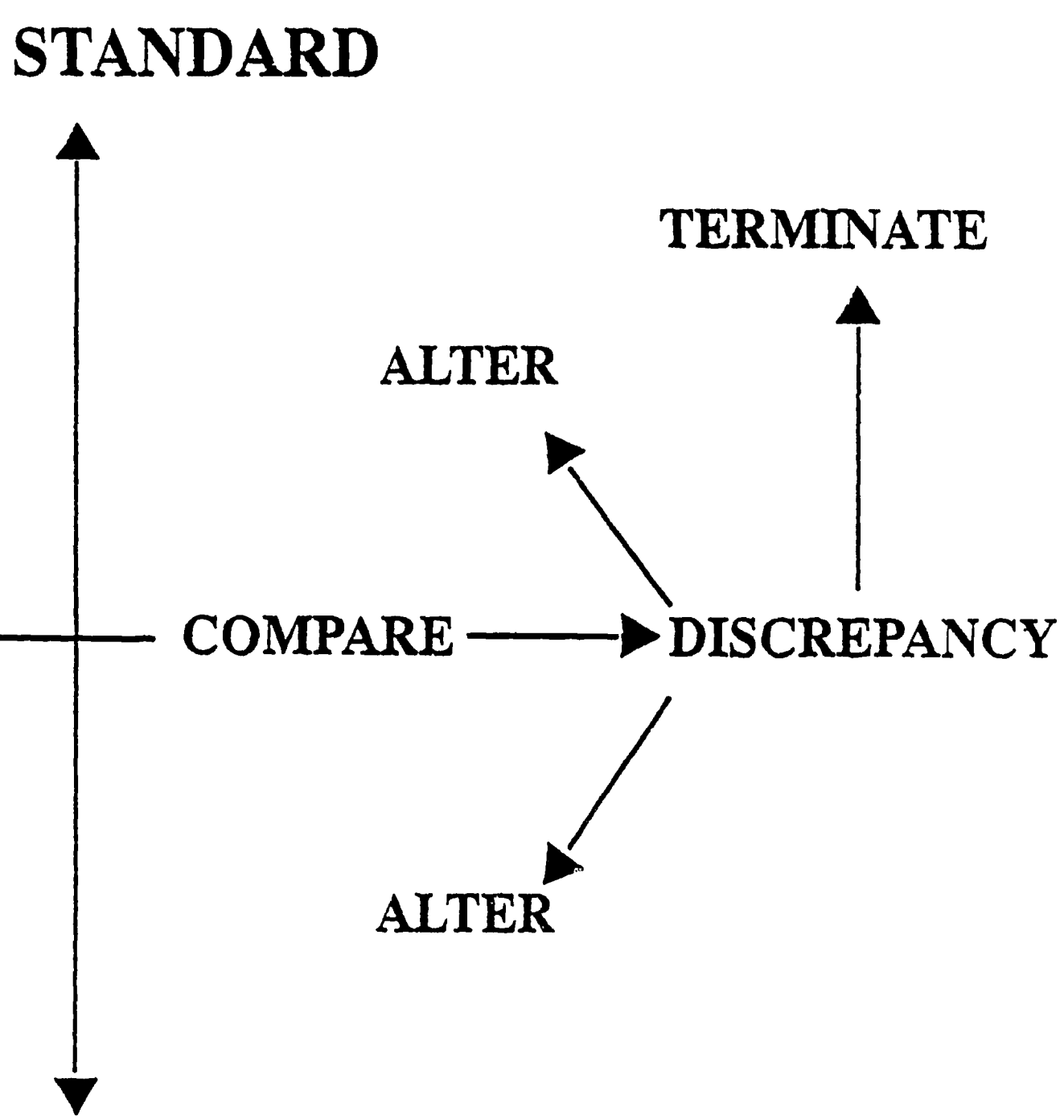

Figure 1. Discrepancy Evaluation Model

Math Problem Solving

Lynn Robinson

PHILOSOPHY

The goal of this presentation is to explore mathematical problem solving as not only a process to find a solution for a problem but to take advantage of strategy identification and application. As well, the use of language in mathematics will be highlighted.

The problem solving process is seen to be just as, if not more, important than solution finding. As ability with process develops, solution finding does as well. It is important that the students see that the process develops a base of strategies that can be applied to a variety of problems whereas a solution applies to only that particular problem. During the process, students use the math skills they already know. The teacher can address new skills as needed to help the problem solving process.

Development of the process involves discussion of what is happening from beginning to end. In a co-operative learning group, the students analyse their progress and form observations and hypotheses. The group's success in communicating their ideas requires a common language base. Mathematical literacy is important to aid this communication.

As well, social and interpersonal skills are required in order for the group to be successful. The group process is an integral part to the problem solving process. The students need to be able to share their ideas and discover that there are many ways to operate within the problem. The articulation process helps them review and consolidate their own thoughts about the problem and the logic behind their solution finding.

In order to personally consolidate their learning, the students maintain a journal. This journal becomes their storage space for the problem as well as the the ideas that were formulated in solving it. Here it becomes important that they again use mathematical vocabulary concisely and that their thoughts are in an organized fashion from beginning to end so that the reader can follow their procedure. At the end of the process explanation, the students reflect about the observations and possible hypotheses that were made and could be used in future problem solving.

Finally the students need to see themselves as not only problem solvers but also as producers. Producers of not only new problems but of theories involving problem solving.

METHOD

In order for the above aims in problem solving to work in practice, the teacher needs to adrress the social skills before the mathematical ones. The students need to be able to work in a co-operative group situation where ideas are effectively shared by way of good speaking and listening skills. Interpersonal skills are essential. They need to learn to gage their success and become aware of the value of acquiring an understanding as a group not as an individual. The old adage "Two heads are better than one" rings true and is even better when there are three or four heads.

Once these skills are in place the students need to learn to be mathematically literate so that their discussions are effective. As a class the students work to solve a variety of problems that use various strategies. As these strategies are discussed, the teacher introduces the proper mathematical term for the strategy or skill.

Once the class feels comfortable with the strategies and vocabulary necessary, the groups then take over. They are given a problem to work on. The teacher becomes the facilitator of the process now, not the director. The group now takes the ownership and responsibiltiy for their learning.

The group works through the problem solving process together, sharing the various approaches and logic systems. Once satisfied that they have thoroughly investigated the problem and arrived at a plausible solution or solutions, the individual written response takes place. It should be encouraged that they be able to show more than one solution process and discuss which they feel is more effective. Each student should now reflect about what they have learned by writing about their process and observations in their journal.

That group is then ready to become producers. The expectation is that they will use their discoveries about that particular problem to compose a new problem. After this they are then ready to attack a new problem.

A class meeting to discuss a problem once everyone has completed it encourages each group to thoroughly investigate the problem. The students share their approaches, generalizations and observations. Knowing this is coming up, you should encourage the groups to try and be creative or original in having a different strategy or observation to share.

Mathematical problem solving is now a group, self-paced process where students who are ready to go on, can; while others can explore a problem further. It is encouraged that the group endeavour to truly delve into the problem and discover all that they can, not just race through to see how many problems they can do.

EVALUATION

The evaluation process needs to cover many spectrums; from interpersonal group skills to mathematical processes. Such evaluation can take place in three forms:

1) On-going informal observations
2) Response journal entries
3) Tests on problem solving

Informal Observations

Here, the teacher assesses the development of the students by sitting in on group discussions. A binder can be set up with a student tracking sheet for each child. Questions can be posed by the teacher to assess understanding and knowledge. Criteria on the tracking sheet may include: able to identify and apply strategies, uses mathematical vocabulary, forms observations and/or hypotheses, articulates ideas well, finds solutions, applies mathematical skills.

Journal Entries

It is important to evaluate the journal entries not only for the mathematical content but also for the written process. An entry should be concisely worded using mathematical terms where applicable, well organized to follow the logic process, and demonstrate an understanding and insightfulness toward the problem solving process. A tracking system much the same as that for teacher observations could be created.

Tests on Problem Solving

The purpose of a test is to assess whether or not a student can use the processes and strategies discussed in the group in order to solve a problem. A test may contain a choice of three problems. The student is to choose one, ONLY ONE, problem and work through the process to solve it. The process meaning, applying a strategy, showing how he worked through that strategy, writing about the process, writing about observations or hypotheses that may have been formed during the process and I have them tell me at the end what they found most difficult about the problem and what was the easiest.

SOME PROBLEM SOLVING RESOURCES

Problem-mathics - Creative Publications
Problem of the Week Series - Dale Seymour Pub.
Problem Solving in Mathematics Binders - Creative Publications (Addison Wesley)
Problem Solving Strategies - Resources for Math Teachers by Ernest Woodward - J. Weston Walch Pub., Portland, Maine
Writing Activities To Develop Mathematical Thinking by M. Ann Dirkes - Trilluim Press
Teaching Problem Solving Strategies - Dolan & williamson - Addison Wesley
Make It Simpler - A Practical Guide To Problem Solving In Mathematics - Addison Wesley

Metacognition: Two New Rs for the Gifted

Beth Sparks

A problem highlighted by Alfred North Whitehead (1929) in the early years of this century as "the central problem of all education" (p. 214) continues to plague us at the end of the century. Whitehead claimed that traditional education produces inert ideas. Students often know things but do not use this knowledge in relevant situations unless explicitly prompted to so.

The classic illustration of inert ideas is a situation where a teacher gave her class 10 minutes to learn as much as possible about a long and difficult chapter. Virtually all the students began with the first word and read as far as they could until the time was up. The students admitted later that they knew better than to simply begin reading. They knew about purpose-setting, predicting, skimming, and so on, but they did not use that knowledge although it would have helped. Their knowledge about reading-to-learn was inert. The students in this case were teachers in a university reading-methods course.

Inert knowledge separates what we can do from what we do do, the difference between potential and performance. The potential-performance discrepancy is a concern for all students but the problem is extreme among gifted children, children who have the potential for extraordinary performance (Alberta Education, 1986). As many as one out of every two gifted children do not perform in school at levels commensurate with their potential (Rimm, 1989). The gap between potential and performance tends to appear in gifted boys in elementary schools and in gifted girls in junior high, and it widens with each passing year.

Whitehead passionately argued that education that results in inert ideas is not only useless but harmful, producing mental dryrot--a vivid metaphor for unsuspected mental decay which leads inexorably to personal and societal disintegration.

Continuing efforts to deal with the challenge of inert ideas shift our attention from the basic three Rs, Reading, 'Riting, and 'Rithmethic, to two new Rs, self-conscious Reflection and Regulation of one's own learning, the twin processes of metacognition. Although the term metacognition first appeared in the literature in the 1970s, interest in things metacognitive can be traced to the dawn of philosophy and the unique human ability to become conscious that one is conscious.

The purposes of this presentation were to facilitate an understanding of the link between inert ideas and metacognition, and to discuss some implications of metacognitive theory and research for energizing gifted children.

Metacognitive theory

There are many and varied reasons for a discrepancy between what students can do and what they actually do with the skills and knowledge they have learned but two approaches have traditionally been used with nonproductive gifted children: cognitive strategies training and motivational counselling. However, inconclusive results (Pizorro, 1982) suggest that will, skill and drill are necessary but not sufficient to energize inert knowledge. Effective learners are not only cognitively and affectively active in the learning process, effective learners are metacognitive--they know about learning and use that

knowledge to inform their learning.

There are several models of metacognition that guide research. These include information processing (Sternberg, 1985), developmental (Flavell, 1981), sociohistorical (Vygotsky, 1978), and contextual (Brown, 1982) models. In terms of the contextual perspective, learning is conceptualized in a tetrahedral model in terms of complex interactions between four commonplaces in learning: learner characteristics, learning activities, criterial tasks, and materials. Learning is a constructive process and individual learners are ultimately responsible for the interaction of situational variables within a particular learning event. Consequently, metacognition, the learner's self-conscious reflection on the job of learning and the learner's subsequent use of that knowledge to regulate the complex interaction of learning variables, underlies successful academic performance.

Metacognition and giftedness

Reviews of comparative studies of groups of mentally retarded, learning disabled, average, and gifted youngsters suggest that metacognitive differences in learning differentiate these groups of children and that gifted children are more likely than their peers to demonstrate early and more advanced metacognitive processes (Borkowski & Kurtz, 1987). However, research on groups of children ignores the heterogeneity of the individuals within such groups. Because gifted children are often assumed to be homogeneous, examining the range of differences within a group of gifted students, all of whom

obtained scores of 130 IQ or higher on the WISC-R, can be enlightening.

In a recent study (Sparks, 1988) of a group of 70 identified gifted seventh-graders, the range of reading comprehension ranged from fourth grade through twelve, 25th percentile to 99th. Indepth analyses of verbal self-reports of text comprehension obtained from the five top-ranked and five bottom-ranked students revealed dramatic quantitative and qualitative differences in self-regulation of learning that suggest that gifted skill - readers, compared to gifted less-skilled readers, self-consciously regulated their comprehension.

Of major importance, although both gifted skilled and gifted less skilled readers monitored their reading (all students produced 50-page protocols), less skilled gifted readers did not use the self-knowledge obtained from monitoring comprehension to evaluate their current performance so as to improve their future performance. They did not learn from their experience. Their knowledge was inert.

Intellectual assessments that are used to identify gifted children do not substitute for educational assessments. Gifted children tend to have high scores on intelligence and aptitude tests. These static scores, however, reflect what a child knows, they are not a dynamic measure of what the child does with that knowledge.

Teaching metacognition

Delores Durkin's (1978-1979) research implies that there is often nothing instructive about instruction. Instead, what

teachers are often doing when they think they are teaching is telling, assigning, and testing. An alternative is for teachers to use their own personal practical knowledge (Connelly & Clandinin, 1988) to scaffold the gaps between what students know, what students can do, and what students will be able to do independently tomorrow. This scaffold initially supports the student and is gradually removed as the student become increasingly independent (Gavelek, 1986).

As mature learners, teachers can bring into consciousness their own personal models of learning and as self-reflective practitioners, teachers can model self-reflection and self-regulation of their own learning. Metacognitive instruction does not require teachers to take special courses in learning theories. In addition, metacognitive instruction does not add a separate course, unit, topic, or study technique to an already crowded student curriculum. Metacognition is a mindful approach to teaching and learning.

What is required in teaching metacognition, is for teachers to work themselves out a job (Gordon, 1985). Metacognitive instruction empowers students. It is common practice for teachers to assess students' needs, plan lessons, match students with materials, select and organize activities, assess students' understanding, point out errors, specify corrections, keep track of progress, and evaluate students' performance (Fischer & Mandl, 1984). The critical questions for metacognitive instruction are: "Who is self-conscious about learning?" "Who is making the decisions about planning, implementing, monitoring, and

evaluating?" The goal of metacognitive instruction is independent learning.

One way of developing metacognition is through cooperative learning with small groups of students. When students work together, they can share not only the tasks but their self-reflection and self-regulation of that learning. Teachers can also provide opportunities for metacognitive experiences when students work individually. Students can use a coding system (Smith & Drauer, 1984) to help become aware of and monitor their cognitive and affective responses to a reading passage. Because some children may find self-reflection and self-regulation about one's abstract academic activities unfamiliar and difficult, concrete puzzles, games and sports can be used to initiate conscious awareness about one's thinking, feeling, and acting.

So what?

"Education is the provision of means to fellow human beings enabling them to structure their experience in ways that continually enlarge knowledge, reasonable belief, understanding, autonomy, authenticity, and sense of place in the past, present, and future of the human race" (Fenstermacher, 1986, p. 46). To educate a fellow human being is to liberate that individual. Metacognition, to the extent that it empowers individuals to know themselves and to take charge of their own learning, is worthwhile. Metacognition may well be a key to unlocking inert knowledge and energizing gifted children--the difference between "being" gifted and "acting" gifted.

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An Academic Model for Educating the Mathematically Talented

Julian C. Stanley

Identification, academic facilitation, curricular flexibility, and articulation of in-school and out-of-school learning are key concepts in the Study of Mathematically Precocious Youth (SMPY), which started at Johns Hopkins University in 1971. I discussed how its principles and practices have helped revolutionize certain aspects of gifted-child education in the United States and elsewhere, especially China. Interested persons may secure a copy of the full paper, including extensive references, without charge from Professor Julian C. Stanley, SMPY, 430 Gilman Hall, Johns Hopkins University, Baltimore, MD 21218.

Using a Computer to Challenge Gifted Students In an Elementary School

Priscilla Theroux

On it's own a computer is a dumb machine. Without a program it can do little more than a pocket calculator. However, a computer is special because, with the development of new software (programs) it can become many new machines. New applications are becoming available even as we think about it. Every minute of every day computer technology develops and expands throughout our culture. A computer is really a most versatile machine.

I do not "teach computers" in the usual sense. My schools operate a "School Based Enrichment Program" based on the Revolving Door Model, & The Enrichment Triad Model by Joseph Renzulli. My primary function is to guide students through Type II and Type III activities. This usually takes the form of Independent Study projects. It is within this context that my students have explored and developed their abilities to use the computer. Students are offered free choice of topic to investigate, and are encouraged to develop the required process skills for investigation and production of their learning. As their "facilitator", it is my job to, help them develop as independent researchers and producers, and to guide them in the development of whatever skills and processes they require to reach that goal.

Contrary to the belief held by some, not all gifted students are interested in computers, but for those who are there is a broad spectrum of relevant applications. It should be noted that my interest in computers and the subsequent development of my own computer skills was a direct result of my student's learning needs and their drive to explore the many possibilities the computer provides.

There are many ways that a computer, even a small personal computer such as the Apple, can be used in the school environment. It can be used as a tutorial for acquiring knowledge and or developing skills in many subject areas. It can be used for developing reasoning skills and sharpening mental faculties. Through the use of a modem it can become ... a research tool to locate current data or a vehicle through which intellectual peers can be contacted and challenged. However it's most challenging use and most intellectually stimulating application lies in the facts that it can be reprogrammed to create completely original uses. All that is required is a little ingenuity, intelligence, a willingness to accept an intellectual challenge, the ability to think abstractly at high levels of complexity and hard work. I will be sharing a few examples of ways they have been used by my students.

I. <u>Simulation programs</u>:

A "simulation" is a program that imitates life to illustrate how something works. For example, I had a grade two student who was interested in the functions of the circulatory system and the heart. He read books, watched films, examined diagrams and models and used a simulation program which illustrated how the heart chambers expanded and contracted to force blood through the valves and to circulate the blood around the system. The simulation program had the advantage of being animated to show the movement of the valves and blood flow, and of being interactive, which enabled the student to control the speed and functions of the program as well as the amount of time he wished to spend on the task.

II. **Tutorial programs:**

A tutoriel program is a program which can be operated independently, to instruct the student in specific skills or knowledge. It has the advantage of giving personalized instruction and immediate feed back directly to the student. Many tutorials are constructed so that a student's aptitude will govern the speed at which s/he may progress through the levels of difficulty. Consistent correct responses will accelerate the student to a higher level of instruction, while incorrect responses will provide re-teaching and further practice on task.

I had a student who was interested in building an electronic interface board that would enable him to connect a toy robot to his computer so that he could program the movements of the robot from the keyboard. Before he could begin to do this he needed to understand electrical wiring and printed circuitry. He required advanced and very specific knowledge. He used a tutorial program called Logic Gates from MECC. This program teaches the concepts of electronic circuitry as well as the kind of conditional reasoning found in the logic of computer programming. After using the tutorial program, he was able to understand the technical magazine article that taught him how to build the interface that he needed.

III. **Applications programs:**

Application programs are the kinds of soft ware that can be used to enter, reorganize, store, reuse and present information. In our cases application programs permit students to create or produce a quality product for communicating the results of an independent study project to an audience. For example Word processors, spreadsheets, databases, graphic programs, crossword, newspaper programs and desktop publishers are all application programs.

1. Word processors

A word processor is the application program that turns a computer into a sophisticated electronic typewriter. It can be used to create any document that can be produced on a typewriter, but has the advantage of greatly facilitating the editing process, and can create a far more attractive presentation. The word processor I use most frequently is MultiScribe because it offers at least ten styles of decorative styles of print (called fonts) which can be used in six different sizes and many styles MultiScribe was designed to provided for the Apple II series of computers many of the functions and conveniences of the MacWrite program developed for the Macintosh computer.

Word processors are most often used by my students for recording, expanding and reorganizing notes; writing letters, stories, poetry, diagrams, lists, acrostics, and even novels.

2. Spreadsheets:

A spreadsheet is an electronic ledger, such as one might use to keep track of a budget. Spreadsheets are made up of rows and columns which intersect to create cells. Each cell will accept type written words (Labels) or numerical information (values). Every cell can be connected to any number of other cells, and codes can be entered so that cells may be added subtracted multiplied, divided, averaged etc. Mathematical formulae can be applied to any sequence of cells. This means that not only can the spreadsheet be used as a ledger to record a budget system, but by changing a simple formula it is possible to hypothesise or predict the effect on a budget of a percentage loss or gain in income or cost.

At this time I have only had one elementary student who has shown an interest in the use of the spreadsheet. She is a young entrepreneur and wants to open her own small business. She has made a large selection of decorative bracelets which she wants to sell to her friends, and needed a system for keeping track of her expenditures and profits. She learned how to use AppleWorks spreadsheet and word processor. She applied the spreadsheet to her business records and used the word

processor to create a "How to" booklet explaining how to create a spreadsheet for a personal use.

3. Databases

A Database is like an electronic card catalogue system and is used to store and reorganize large quantities of information. Students can set up many fields and enter data in each field. The advantage a data base has over the traditional card catalogue is that it can be reorganized numerically or alphabetically in any field in seconds. Data bases can be used by teachers to keep track of all registration or personal information on all of the students in a school. It could be used by a student to catalogue items purchased and keep a track of the cost, author, title, publisher, retail outlet and/or distributor for each item purchased. I have recently had a student undertake to assist the school administration by entering all information received from a parent volunteer survey into the Appleworks database. The data base will permit any part of the information to be located in any sequence almost instantly. Any one questionnaire can be accessed instantly or reports can be printed out indicating the list of people who have volunteered for one specific job together with the details of the days when they are available, or in fact, you can print out a "tables" list showing all entries in all categories to see a summary of all the data at a glance.

4. Graphic programs

A graphic program is like an electronic drawing board. There are many graphic programs available for all computers. Graphic programs can range from freehand drawing, coloured painting, technical drawing, or animated comic book programs. The most frequently used graphic at the elementary school is MousePaint. Mousepaint permits the use of 5 large text fonts, and tools for drawing lines, boxes, circles and freehand drawing either using the mouse or a graphic tablet. Students can change the size of the pen, the width of the lines and the colours being used. They can fill in areas with texture or colour, or use a spray can to sprinkle colour over an area. MousePaint is most often used by my students to make diagrams or posters to present information. However, it is also frequently used to design and save the graphic screens which will later be used by students who are creating their own computer programs.

5. Crossword

A crossword program is intended for creating original crosswords puzzles which can then be used as a task for someone else. Many of my students at the grade 2 - 4 level have used this useful program to neatly type out crossword puzzles that they have created. The program has a printer function so students can make as many copies as they wish, with clues, a word list and or answers which may be shown on the crossword, to suit the level of difficulty to a particular audience.

6. Newspaper programs

Newsroom is the most popular Newspaper program for the Apple computer Newsroom has five departments: The Copy Desk, Layout Department, Photo Lab, The Banner Shop and Wire Service. Students can select graphic images from a library of 600 cartoon pictures (with 1200 more from each clip art disk purchased) or they can modify or create their own graphics using MousePaint-like tools. They can capture these images as a "photograph" and paste them into a banner (headline area) or panel. Text can also be added to each panel and the Newspaper can be printed out on either 8 1/2 by 11" or 8 1/2 by 14 inch paper. The wire service permits information to be transferred either to or from another computer via a modem connected to the telephone system. The program is not difficult to use but it is very complex. Due to its complexity it is often suggested that it is more appropriate for the use of older students (gr.6 or higher), however, with gifted students in small groups I have had grade one and two students who have used it very successfully.

7. Desktop publishers:

Desktop publishers permit both pictures and text to be placed on a page using multiple columns, many sizes of text, and style functions. There are now several Desktop publishers available for the Apple. For example: Publish It!, Geo and Springboard Publisher. I can recommend Publish it from personal experience. One of my students had Geo at home and he highly recommended it. I would not recommend Springboard Publisher to anyone who did not have an enhanced Apple IIGS with at least a megabite of memory plus either an additional external 3 1/4 drive or a hard disk drive. Even then I found it **very slow** and cumbersome. However the graphics are exceptionally good. Springboard Publisher is barely possible for use on an Apple IIe or IIc even with a double disk drive, and only then if you have exceptional patience and many hours to spare. Desktop publishers are very complex but they permit students to create almost "professional" presentations.

IV. Using a modem

A modem is an interface that connects a computer to the telephone lines, and can be used to access information from other computer sources. At this time I have had very little personal experience using the modem. However I have had gifted students who have explored this vehicle for communication and they have found it very exciting. Exploring this area is a goal of mine, since I can see very exciting possibilities for its use.

I am aware that many electronic Bulletin boards are available for enthusiasts to share information. Some of my students have developed many unseen friends this way They have also used the Bulletin boards to post questions when they have experienced difficulties programming. Someone always seems to respond to the request with the needed expertise.

Some schools here in Calgary have used the modem to permit students to challenge each other in the areas of mathematical problem solving. Teachers enter challenging problems and students can respond by entering possible solutions for other users to examine. Other students respond by challenging the solutions and suggesting better ones. This is certainly a boon for the student who has no intellectual peer (in problem solving) among the students at his/her own school

Another possibility for the modem is to access one of the national or international data bases for research purposes, for example a major newspaper source. Unfortunately this involves both telephone and data base costs, so unfortunately, this may be cost prohibitive for Elementary schools.

I hope that in the future it may be possible for young students to access the main-frame computer at a university, permitting young students access to advanced courses directly from their homes or schools.

V. Developing high level reasoning and problem solving skills.

There is a great selection of software that can be used for developing the powers of the mind. There are many Arcade games, Chess games, and adventure games available for the Apple which not only develop advanced thinking but can be almost addictive to a child whose intellect is not often challenged in other ways Below you will find some programs used in my classes. I tend to use these programs with the less successful, unmotivated or un-cooperative gifted student. These programs not only teach strategies for developing thinking ability they are also highly motivating. They serve multiple purposes such as: grabbing the interest of a marginally motivated student, getting the student to begin to enjoy and feel enthusiastic about learning, and developing methodical thinking strategies in the impulsive or disorganized child.

PROBLEM SOLVING STRATEGIES-	MECC software	Strategies
MINDPUZZLES	MECC software	Strategies

THE 4TH R (Deductive Reasoning)
MINDCASTLES (Deductive Reasoning)
MINDBOOSTERS -Trillium Press (Deductive Reasoning)
ANALOGIES (Analogical reasoning)
ADVANCED ANALOGIES (Analogical reasoning)
WHERE IN THE WORLD IS CARMEN SANDIEGO?
(Use of an almanac, geography, etc.)
WHERE IN EUROPE IS CARMEN SANDIEGO?
WHERE IN TIME IS CARMEN SANDIEGO? (History)

VI. **Creating original computer programs in BASIC & LOGO languages.** (Including creating music, graphics & animation.)

It's not the application or exploration of existing software that offers the greatest stimulation and satisfaction for many of my students. It is the act of creating completely original computer programs that provides the greatest intellectual challenge.

You do not have to be gifted in mathematics to program the computer, however, a child who is gifted in mathematics may learn to write original computer programs in LOGO at an early age. I have had gifted students learning to use LOGO from grade 1 to six. It has been my experience that gifted students can usually manage programming in BASIC from the 4th grade. It is probable that BASIC could be successfully introduced in the younger grades but I have not tried it with students below grade 4 yet.

Logo, like other computer languages has its own vocabulary of terms (called "primitives") and commands and syntax, . But what makes it special is that you can define new procedures which will act like a command. And one procedure not only calls on, and operates, other procedures but it can also call upon itself, creating infinite repetitions.

LOGO has a text screen and a graphics screen. Graphic images can be created in a variety of colours. Younger students usually focus on the turtle graphics which provides an opportunity to learn a great deal about geometry in an experimental environment. Once a student has mastered the graphics they usually progress to the use of text. It is at this point that students are able to create original programs. The greatest advantages of LOGO programming are: the lateral development of more advanced mathematical skills and the development of the concept of "top down" structured programming. Top-down programming means that students learn to define a simple "driver" procedure that can operate other procedures in a "modular" or building block fashion. This involves a hierarchical classification of levels where some procedures are driven by another procedure which is in turn driven by another etc. The disadvantage of LOGO is its speed. It tends to be much slower than any other computer language.

BASIC programming involves one text screen and two types of graphic screen. Low resolution graphics, which illuminates blocks of colour, and High Resolution graphics, which illuminates individual pixels (dots) on the screen. Low resolution has the advantage of 15 colours and bold images. High resolution has the advantage of detailed images, but uses only six different colours. Both high resolution and low resolution screens may be used for animation. Basic programming also has it's own vocabulary and syntax, and it depends heavily on logical thinking. It is absolutely sequential in nature and depends on conditional logical statements to modify the sequence of operations.

During the past four years I have had many students learn to program the computer. It is an expectation in my program that students will create an original product with the knowledge that they acquire during my classes. Every student who

has learned to program the computer has also created a least one original computer program, some of them very simple and some very sophisticated.

VII. Calgary Computer Programming Competition.

For the past ten years, a competition has been held in Calgary, where students can challenge themselves to solve given problems in a specific time span, and compete with each other to find out how their skills compare with others who have the same passion for computers. During the past five years the competition has also included a creative competition for students who have written original software. The competition is open for students from grade 5 to 12 and there are usually about 150 - 200 students competing. Younger students may enter in the grade 5 category, however, no allovance is made for their age. I have entered students in this competition for the last four years. It has always been a very rewarding experience for everyone involved.

Specific computer models, as all other technological machinery, invariably become obsolete all too soon. However, the skills and abilities used to "create" with a computer never will. Of course, langueges for the computer are frequently revised, and new langueges are constantly being developed , but the skills are easily transferable, both from one language to another, and from one model of computer to another.

Once students have mastered the rudiments of programming logic and the vocabulary of one of the computer langueges, they are limited only by their imagination. The depth of involvement in computer programming, can vary as much as the use of the commercial programs listed above. My student's creative computer projects have ranged from, the modification of public domain software, the presentation of expository articles printed on the screen, experimental programs which animate a graphic image or create a piece of music or the development of a utility program. The more ambitious students have undertaken the challenge of developing complex adventure programs exploring... the depths of an Egyptian Pyramid, a space fantasy, an "Impossible" military mission, creating a "Utopian" society for the 23rd Century, developing informative programs describing the current political situation in Germany or a simulation program demonstrating a baseball game. Perhaps the most sophisticated and certainly the most electronically advanced project was created by the grade 6 student who built an electronic interface which enabled him to connect a toy robot to his computer and program it's movements to simulate the actions of an industrial robot.

Although two of these students have gone on to Jr. High school, three of these students are demonstrating their accomplishments at the Idea Market Place at the SAGE conference this year.

Content-Based Curriculum for the Gifted: What Works

Research Capsules on Program Management Issues for Gifted Programs

A Curriculum/Instructional Design Model for Constructing Curriculum for Gifted Learners

Joyce VanTassel-Baska

There is a copy of each of the above (in the Centre for Gifted Education, The University of Calgary) or information is available from Joyce VanTassel-Baska at The Centre for Gifted Education, The College of William and Mary.

In addition, you may be interested in the following readings:

VanTassel-Baska, J. (1986). Effective curriculum and instructional models for talented students. *Gifted Child Quarterly, 30*(4), 164-169.

VanTassel-Baska, J., & Campbell, M. (1988). Developing scope and sequence in curriculum for the gifted learner: A comprehensive approach. First in a series of five articles. *GCT, March-April*, 2-7.

VanTassel-Baska, J. (1988). Developing scope and sequence in curriculum: A comprehensive approach. Second in a series of five articles - Curriculum needs assessment. *GCT, May-June*, 29-34.

VanTassel-Baska, J. (1988). Developing scope and sequence in curriculum: A comprehensive approach. Third in a series of five articles - Curriculum frameworks in the content areas. *GCT, July-August*, 58-61.

VanTassel-Baska, J. (1988). Developing scope and sequence in curriculum: A comprehensive approach. Fourth in a series of five articles - Curriculum alignment. *GCT, September-October*, 42-45.

VanTassel-Baska, J., & Campbell, M. (1988). Developing scope and sequence in curriculum for the gifted learner: A comprehensive approach. Last in a series of five articles - Implementation considerations. *GCT, November-December*, 57-61.

VanTassel-Baska, J. (1989). Curricular approaches to gifted and talented education. *Thresholds in Education, XV*(2), 29-34.

VanTassel-Baska, J. (1989). Appropriate curriculum for gifted learners. *Educational Leadership, 46*(6), 13-15.

Thinking Families

Gerald W.Ward

Providing a family environment in which children can develop to their full potential is probably an objective of all parents. In this paper I will examine some of the ways of implementing this kind of home environment. I began researching this topic over five years ago while working on a thesis at San Diego State University. At that time, I found that there are a great many papers on thinking in the academic literature. Much of the research deals with the so called higher order thinking skills (a.k.a. HOTS). The Education Commission of the States, 1982 calls this the Basics of Tomorrow". I do not wish to provide for you an encyclopedia of thinking terms. They exist already in other places (no doubt for sale at this very convention). In this presentation, I have no intention of parading a plethora of problem solving strategies. Curriculums exist for these as well. I will set the scene for us to examine our own families and see how we are doing and how we can improve.

Facilitation of this presentation creates an atmosphere of interaction among all the participants. A dilemma exists preparing a traditional written paper for a topic which cannot or should not be presented in a traditional manner. I hope that I will give you, the reader, an opportunity to feel a part of the interactive group. You have the choice to read through the paper like the person who sits at the back of the room taking in ideas, or you can engage yourself and try to feel a part of the overall discussion group.

A number of years ago, one of my colleagues had been dealing with a child who not only was an underachiever, but his behavior was totally erratic and bizarre. This unpredictable kid was not really dangerous to others in a violent sense, but he was at risk to himself. Basically, the child had absolutely no common sense whatsoever. The data indicated that the boy had an above average IQ. This was not surprising since his parents were both highly educated and successful people. The boy's father was an architect, his mother was a Ph.D. biochemist engaged in Cancer research. Analysis of the home situation showed that the father was definitely the head of the household and his decisions were the law. So what! Additional observation of the home situation revealed that the father was an extremely quick thinker. From input of external information to the decision was immeasurable milliseconds. There sat the key to starting to solve the problem. The child had seen this behavior modeled since he was a small child. To him, decisions must come in an instant like the snap of the fingers. Therefore, when given information (and in many

cases when he had no information) the boy made some rash judgement which could easily spell trouble.

Think about what kind of thinking processes you demonstrate to your children. Do you let your children in on your decisions and the processes by which you arrive at those decisions? It is hard to do. In fact most of us would probably have to do some thinking even to know how it is that we came to those decisions. Many of the small steps involved have become very automatic over the years. We hope that our children will be able to do the same kind of thinking. Perhaps they do, but what happens when they don't? I believe that it is important for us to demonstrate at least where possible what we are doing when we come to a decision. Of course not every time, but it should be possible to talk our way through our choices in front of our children from an early stage in their life.

As I mentioned above, there are all kinds of elaborate processes for problem solving. I don't think that it is important to have names for all the steps or to treat the thinking process as a set of algorhythms which are to be repeated as some of the so called "thinking" curriculums propose. What is important is help our children develop patterns of thought which will help them think and therefore become more successful adults.

When we are faced with a dilemma or a problem we usually go through the same very simple steps. We first have to figure out what exactly is the problem. Associated with this we try to determine the cause. We then select several possible solutions to the problem and any other consequence of that solution. From this array of information we use our best judgement and proceed to solve the problem, or at least try. Often we go through these steps at lightning pace. My message here is that we allow our kids in on the process. As our children mature, we begin to let them in on the process when appropriate.

For about five years now I have asked the students that I meet to tell me (most recently in journal form) in what ways their family has taught them the thinking skills or as a family practiced the thinking skills. In most cases the response is not much. This does not surprise me because I am sure that if I were to ask my own child, her response might be limited before I specifically started to spell out to her that this was what we were doing as a family which encourage thinking.

I previously asked you how you demonstrate the thinking processes to your children. Now I want you to consider the ways you teach your children the thinking skills and how do you practice this as a family. It surprised me, but a large

number of responses are about video games or Nintendos as if hand-eye coordination and thinking are one and the same. Well, I suppose one could justify those games in that manner. It is somewhat more interactive than television, but in my view not the only type of thinking that I hope most families are doing.

Here are a couple of examples of student journal writings. In each case, the student just was beginning the year in Grade 7 and introducing themselves to me. Both examples are boys.

Student A.

"This summer I went to the Adriatic Sea coast and went diving. I gathered many different kinds of shells and saw many fish. Along with my sister I gathered a large collection of shells. I also made a necklace of crab claws.

I want to be a doctor when I graduate from university, either neurosurgeon, surgeon, pediatrician or general practice. I would also like to enter the science fair and win!!"

Student B.

"I went on a trip to penticton b.c., BORING.
Then I did Zilch except for playing nintendo
now, As you probably guessed I'm in school!??
Why is summer so short and school so long?

aaaaaaarrgh!

well you know why I'm in this class but I don't!
but luckily I want to know more and I mean more about science than I do know now and that aint lots and I meant it. I'm here to learn ya know! "

A number of important points can be raised about these two families just from these two samples of work. The thing that jumps right out at me is how student A remembers specific things from his trip that include both a scientific and artistic component. It would be my guess that the parents in one way or another help the student interpret the natural world or the vacation, and encourage the imagination and inventiveness when it comes to creating things.

Beyond that, Student A already has some specific short term and long term goals with regards to school. School to this student is important. No, he did not go on to win at the science fair. Other students in our school had more experience at the fairs and knew how to come up with

competitive projects. This student had never been to a fair when he wrote this and probably did not know what was involved. He did however have that goal. The longer term goals, who can tell. other research tells us that kids change these many times before adulthood. The important thing is that he has goals.

Student B finds the summer holidays boring, and knows that school will be even worse. Already on the first day of school, he is convinced that he does not want to be there. even though he knows of nothing else worth while for him to do. At least he does state that he wishes to learn, but he places that focus of that learning back into my (the teachers) hands. If only there was a knowledge pill he could take. Learning is the end point, not the journey to this student.

These students are both of similar IQ in a gifted program. Student A however, has the advantage because he has been stimulated to be ready for school by his parents. Student B has not had this advantage. When parents come into school because their child is failing, there is no quick cure. There is a lifetime of attitudes and example that comes from what I have titled The Thinking Family.

As I suggested before, many of the students surveyed indicate that their family has no specific way to demonstrate thinking. Naturally, there must be a serendipity at work to ensure that the skills are passed on to most of the children, but I have been looking for ways that families can specifically ensure that the thinking skills are transferred to the children. The school systems have many agendas. and one of them is teaching children the thinking skills. It is probably a lower priority, not by design. but by default since there are so many immediate and measurable priorities of the school system. There are some school districts which adopt specific thinking skill curriculums. These unfortunately tend to be sets of algorythms for thinking about set problems in set ways. I don't know if I wish to leave such an important set of skills for the school system alone.

In my surveys I have come across some interesting alternatives which various families use. A shocking number of children talk about the arguing or fighting of their parents as being models of thinking skills that produce winners and losers.

Closely related to this, but certainly more planned, are the family debates. Many variations of this have been reported, but the method I prefer are the debates where objective topics are set by the parents often resulting from situations that were on the TV news and then discussed i.

the family. One child indicated that after seeing a "conflict", each member of the family would say how they would solve the problem if they were the Prime minister (president, minister of, mayor et cetera). Similarly, a number of students (usually but not always boys) say that they watch sports with a parent, and then analyze the games and discuss coaching strategies after the game.

Another inadvertent method of learning thinking skills was reported by a young girl who said she had already moved ten times. This of course builds organizational and decision making skills especially with regard to how and what to pack, and what should be thrown out. Related to this, many families have weekly planning schedules. We use a calendar in our home which comes from the Polestar Press called The Family Calendar: A Family Time Planner and Home Management Guide. The organization of this lends itself well to having the entire family involved in the planning sessions. The kids become directly involved in deciding what jobs are to be done for the week and who has the specific responsibilities. They can see that everybody gets good jobs and ugly ones, but that all the chores must be done. This method is more successful that the assigning of jobs by the parent because it gives ownership as well as responsibility to the child.

Thinking Families also involve their children in the budgeting process. As children become older, they can become more responsible and learn the value of money by planning a budget and then sticking to it. Children can also become involved in more major decisions relating to family budgeting, perhaps helping with the holiday plans and spending at first and eventually being brought into the thinking involved with major purchase decisions. I came across one situation where the father was so exasperated with the children always leaving doors open and wasting energy in other ways, he brought out the bills for several months. After some discussion on energy saving strategies with the children, he promised to share half the savings of future bills directly with the children in the form of increased allowance. In this case, the thinking and planning had a direct and measurable reward for the children.

Many families are bilingual and the children keep up their first language at home while speaking English at school. That is easy for first and second generation, but becomes more difficult the longer the family has been in this country. One student told me how his grandparents played games with him in their first language. As he became more proficient in the language, they would speed up talking faster and faster to force him to keep up with the skills.

I would never have thought of the following example myself, even though it is something that I love to do. On two separate occasions students have reported to me that their family goes for hikes on fine days. Then at the end of the trail, they find a satisfactory spot and each family member just sits in solitude for a length of time and engage in reflection and introspection. What a fine idea.

After working on this project for close to five years, this paper represents only a small chapter in a much larger work. In closing, I want to touch on one last but very important concept. A child's self confidence is related to the thinking skills because, without the confidence, the child will not necessarily act on the thinking that they have done. Clear thinking on the part of the children leads to a better self image. In biological terms, this represents a positive feedback loop. Each reinforces the other. Thinking families can plan to ensure that their children are provided with the everyday thinking skills and develop high self image.

The Hidden Potential of the Handicapped Gifted

Carolyn Yewchuk

Who are the gifted handicapped? Because of the multiplicity of handicapping conditions, and the multifaceted aspects of currently employed definitions of giftedness, a variety of individuals with different profiles of strengths and weaknesses may be considered to be gifted handicapped learners.

Handicapped children typically include the mentally retarded, hearing handicapped, speech impaired, visually handicapped, learning disabled, seriously emotionally disturbed, orthopedically handicapped or health-impaired. In general, these children are eligible for special education services if the impairment prevents them from performing appropriately in regular programs. Except for mental retardation, all of these categories of handicap can co-exist with potential giftedness.

According to the most widely quoted definition of giftedness in the literature, gifted children are those with demonstrated achievement and/or potential ability in any, some, or all of: general intellectual ability, specific academic aptitude, creative or productive thinking, leadership ability, visual and performing arts, and psychomotor ability (Marland, 1971). These children require differentiated educational programs and/or services beyond the regular school program to realize their individual and social potential.

Based on the combination of the definitions of handicap and giftedness, a gifted handicapped child, then, is one who requires special education services for one or more types of handicap and one or more areas of potential giftedness.

Concern with individuals who are both gifted and handicapped is not new. Historically, there have been many instances of handicapped individuals who have made unique contributions to society. Some obvious examples include Helen Keller (deaf, blind, mute), Thomas Edison (deaf, dyslexic), Beethoven (deaf), Albert Einstein (dyslexic), Itzhak Perlman (physically impaired). How many more gifted individuals, however, have been unable to transcend their handicap because their potential has not been identified and/or specialized training has not been available?

Before the 1970s, gifted children with handicaps were generally undereducated. Where they received special programming, if at all, it was in the area of handicap, with no special provisions for extending their gifts and talents. Especially with severe handicapping conditions, teachers regarded the development of necessary skills to be so important that other considerations, including encouragement of potential giftedness, were relegated to a position of secondary importance. Within the last fifteen or twenty years, however, there has been a growing attempt to meet the full range of educational needs of gifted children who may also be handicapped.

The incidence of gifted handicapped children is very low. Various estimates range from a conservative 2% of all handicapped children in the United States or between 120,000 and 180,000 (Schnur & Stefanich, 1979), to a more liberal 5% or between 300,000 and 540,000 (Whitmore & Maker, 1985). These estimates are based on the assumption that the incidence of giftedness among the handicapped is similar to that within the general population,

given that, with the exception of mental retardation, handicapping conditions typically do not preclude giftedness. Reported percentages within subpopulations have varied a great deal: 2.3% of learning disabled children (Mauser, 1980), 4.2% (Gamble, 1985) and 6.1% (Yewchuk & Bibby, 1989a) of children in classes for the hearing impaired, and 9.2% of preschool handicapped children (Karnes & Johnson, 1986). These empirically derived rates cannot be considered definitive, because of inconsistency in the operational criteria for giftedness and, more obviously, the nature, severity and effect of handicap.

There is general agreement that modification of the screening and identification procedures commonly used with gifted children is required in order to increase the likelihood of recognizing potential gifts and talents among handicapped students. General guidelines for modification proposed by Maker, (1977; Whitmore & Maker, 1985) include comparison with like-handicapped peers, not with the general population of gifted learners or non-handicapped students; modification of test situations to make it possible for handicapped students to respond without bias to their true ability; and greater emphasis on characteristics instrumental in successful compensation for the handicapping condition. In some cases, it is recommended that the IQ criterion cut-off requirement for admission to programs for gifted learners be lower for the handicapped than the non-handicapped. For example, educators working with the learning disabled gifted typically use WISC-R scores of 120 or 125 on any

one of the Verbal, Performance or Full Scales instead of the more commonly employed 130 and over (Yewchuk, 1986).

In general, what teachers need to be sensitized to are the ways in which handicapping conditions can impede the expression of characteristics revealing giftedness. Where normal channels of expression are blocked, teachers must seek out alternate modes of assessing superior qualities of thought. "Identification must depend less on oral and written language to reveal giftedness and rely more on assessing mental abilities through tasks requiring problem solving, memory, critical thinking and creativity" (Whitmore, 1981, p. 110).

Appropriate educational programming for handicapped gifted children combines basic approaches and practices from handicapped education as well as gifted education. In general, such programming includes accurate diagnosis of strengths and weaknesses, special education services for deficits, accommodation of gifts and talents and development of self-concept (Yewchuk & Bibby, 1989b). Program particulars are specific to type of handicap and area of giftedness addressed, for example, Retrieval and Acceleration of Promising Young Handicapped and Talented (RAPYHT), for preschool handicapped children, or enrichment for learning disabled students.

In the RAPYHT program, teachers are trained in recognizing characteristics of gifted and talented children and in facilitating the emergence of talent (Karnes, 1984). Screening instruments in the six areas of giftedness have been developed by project staff for use by parents and teachers. The final

identification of children for RAPYHT programming is determined by a multidisciplinary team on the basis of parent and teacher referrals, standardized test results, observation of the children and exhibited characteristics of giftedness. Following an in-depth assessment of a child's level of functioning within each talent area, a Talent Education Plan is written, analogous to an Individual Education Plan for remediation in areas of weakness, and individualized programming is implemented. Family members are viewed as partners in the RAPYHT program, and encouraged to participate, according to their needs, interests, and level of comfort. Project evaluation of creativity, basic skills in the talent area, interests in the talent area, task persistence and self-concept is conducted annually on a pre/post test basis.

Baum (1988) believes that enrichment programs for gifted learning disabled students should focus on the children's gifts or talents. They should not be embedded within a remedial model. Remedial approaches tend to focus on isolated basic skills such as mastery of math facts or phonetic analysis. Such noncontextual learning is at odds with the global, contextual learning styles of gifted students (Baum & Kirschenbaum, 1984).

Many concerns have been expressed recently that the handicapped gifted are not receiving appropriate educational services. Gallagher (1988) identified the handicapped gifted as a priority in describing an agenda for educating gifted students in the United States. Although estimates of the number of handicapped children who are receiving gifted services are difficult to obtain, Whitmore (1988) argued that the handicapped

gifted are underserved. Gamble (1985) estimated that 15% of the hearing impaired gifted in the USA are appropriately served, and there is no reason to assume that the figures are any higher in the case of other handicaps. Obviously a large pool of individuals exist whose potential gifts and talents are hidden within educational settings focused on their handicaps.

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