

Meeting the Needs of Exceptionally Able Students

ACKNOWLEDGEMENTS

The Division of Student Support Services, Newfoundland and Labrador Department of Education
Programming for Individual Needs: Using Technology to Enhance Students' Differing Abilities,
1996

CLOSE UP

MEETING THE NEEDS OF EXCEPTIONALLY ABLE STUDENTS

Lydia is an eleven year old exceptionally able student. She is presently in grade 6 and her reading level is at a high school level. Lydia is highly motivated and excels in all her academic subjects, maintaining an A+ average. She is a hard worker and completes all class assignments and projects with a unique flare. Lydia is a very pleasant and cooperative child; however, she sometimes prefers to be alone rather than with other children.

Lydia was recommended for an enrichment program being piloted in her elementary school. Lydia has a flare for writing and was able to express her talent through her stories and poems which she sent electronically to an author for feedback. Because of Lydia's skills in writing she was chosen to be editor of the school newspaper. Again her talent was greatly appreciated. Besides writing news stories, she edited many other students' work. Lydia also completed an in-depth novel study and participated in a math enrichment pullout class.

Lydia is the younger of two children in her family. Her older sister is also exceptionally able and is presently completing grade 12. Lydia is involved in many extra curricular activities. She plays the flute and piano and takes singing lessons. She is also a member of a swim team.

MEETING THE NEEDS OF EXCEPTIONALLY ABLE LEARNERS

An exceptionally able or gifted learner may demonstrate achievement or potential ability in general intellectual functioning, specific academic aptitude, creative thinking, leadership, visual and performing arts and psychomotor skills. The student may display any one or a combination of these abilities and may exhibit several of the following characteristics.

CHARACTERISTICS

- above average intelligence, motivation, creativity and task commitment
- learns at a faster pace than peers
- good memory
- advanced ability to think abstractly
- superior ability to use words
- generalizes skillfully
- well developed attention span
- outstanding problem-solving ability
- high mathematical reasoning and ability to grasp math concepts
- persistent intellectual curiosity (forever asking “why?”)
- original/unique ideas
- wide range of interests
- risk taker
- independent, self-motivated in learning
- high energy level
- high sense of justice and fairness
- high degree of responsibility
- perseveres, doesn’t give up easily
- creative ability or expression in visual or performing arts (e.g. music, drama, art, dance)
- fluent in idea generation
- flexible thinker (approaches problems in many different ways)

TECHNOLOGY RELATED STRATEGIES

Today’s information technologies hold great promise for all students, especially those who are exceptionally able. Acceleration and enrichment of the curriculum may have been somewhat limited to students in the past, but CD-ROMs and use of the Internet (eg. Stemnet’s School Rings Projects) enable students to explore topics beyond the regular

curriculum and to share their discoveries with students in classrooms around the globe. Schools should aim to expose high achieving students to as many technologies as possible. For those students who are “natural technical wizards” and have great interest in various technologies, schools may assign mentors to provide extended learning and communication opportunities.

High Tech

Multimedia programs. Students can create hypermedia programs to support presentations, reports and curriculum in various subject areas.

Scanners. Scanners (flatbeds or handheld) are powerful tools which enable students to incorporate images (color/black & white photos, pictures) into presentations, newsletters and documents etc.

Productivity tools. Databases, spreadsheets, graphics programs and multimedia programs enable students to organize, create and evaluate their own work. These tools engage students in problem solving, where they test and retry various strategies.

Technology-based artistic tools. Video production, digital photography and computer-based animation encourage artistic expression among those students who are artistically inclined offering alternatives to traditional tools.

CD-ROMS. CD-ROM (compact disc-read only memory) is an efficient storage technology with a very high storage capacity. For example, a CD-ROM storing an entire set of encyclopedias such as Grolier Electronic Encyclopedia [Grolier Electronic Publishing] transforms a Personal Computer into a library allowing a student to investigate endless topics. Gifted students can also use interactive CD-ROM programs to study independently at their own pace.

Distance Education Technologies. These technologies bring important learning opportunities to students, especially to those in rural communities. Students meet at community sites where there are cable or satellite receivers, phone lines and video cameras providing one or two way audio/video links to the course instructor. For schools in remote areas this may be the only means for a student to take an advanced course.

Integrated Learning Systems. These systems individualize instruction by offering thousands of basic skills lessons at the student’s accelerated pace.

Calculators (with plotting and graphic capabilities) allow students to see the results of computations in graphic format.

Interactive Videodisc is a type of multimedia which stores sound, text, graphics and video and is used for high-quality still or motion pictures. It enables students to interact with huge amounts of information stored on the videodisc. For example, The National Gallery of Art Videodisc [Voyager] has a complete archive of the National Gallery's Collection of sculpture and painting.

Video Integration Software such as QuickTime for the Macintosh and PhotoMotion for the IBM allow students to insert video sequences into instructional software.

Microcomputer-Based Labs. These labs use computers and probes to determine information such as temperature, light intensity and pH levels.

LCD displays or large-screen monitors are powerful tools for students to use when giving presentations of multimedia creations. Accompanying sound, graphics and video will enhance presentations by students who are exceptionally able.

Telecommunications Networks such as the Internet allow students to access current information in an unlimited range of areas of interest. Students can use telecommunications to access publications, training materials and data. They can also communicate with others in far away places through electronic mail and bulletin boards.

Virtual Reality (VR) programs provide visual and kinesthetic experiences within the confines of the classroom that would not otherwise be available. Students strap on special goggles connected to a "data glove" which provide a three dimensional environment simulation of real life. *These programs will become more accessible to students as the cost of VR programs decrease.

GENERAL STRATEGIES

General strategies to use with exceptionally able students should include the following:

- Build programs upon mastered concepts and skills.
- Allow for in-depth exploration of topics.
- Incorporate higher level thinking and problem solving skills into content.

- Incorporate a wide range of resources and materials and new technologies.
- Make room in the program for self direction, planning and evaluation.
- Vary time and pace by compacting or shortening time required for learning concepts and skills and by providing more time for in-depth explorations.
- Provide opportunities for students to develop and/or practice leadership skills.
- Have students deal with topics of interest and concern.

SPECIFIC STRATEGIES

The following alternate instructional strategies can lead to enriched and more fulfilling education for the exceptionally able learner.

- The accelerated pace at which highly able students learn requires flexible pacing strategies such as *skill grouping, curriculum compacting and contracting*.
- A thirst for in-depth exploration of topics requires program provisions for *primary or original research, independent studies, mentorships, or courses at another school through distance education or actually attending the school*.
- Individual and advanced interests may be met by offering *mini-courses, interest groups, clubs and science fairs*.

Several of these and other strategies are described below. They are designed to tap into the high motivation, broad range of interests, and early desire for independence found in these students before they become bored and tune out of school programs that do not meet their needs.

Curriculum Compacting. This is a strategy which allows a student who demonstrates mastery of a topic or skill area to spend less time on the regular curriculum and more time on advanced study and areas of interest. The teacher compacts a subject in the following manner:

1. The teacher must find out what the student knows in a particular area which appears to need compacting by pretesting, observing, interviewing and analyzing performances.

2. For those areas where student does not demonstrate a mastery level, (predetermined by the teacher) he or she joins the regular class for instruction.
3. For those areas where the student shows mastery, a learning plan or contract is developed.

Contracts. A contract may be used when a student reaches a specified criterion on a pre-test. The contract usually includes outcomes required by the whole class and a list of possible alternative or extension activities from which the student may choose. This list may include any number of options once a student's program has been compacted and extra time is available.

Independent Study. An independent project is a student directed study where a student investigates a "real life" problem, topic or interest. Usually with the teacher's assistance, the student learns to focus on an area he or she wishes to study and develops a plan of action. The student is required to monitor, share a product with an audience and participate in his or her own evaluation.

Tiered Assignments. Assignment choices are provided to meet the diverse needs of students in a classroom. Students work on the same unit in social studies for example, but may do questions and assignments at different complexity levels. Teachers (or enrichment students) create assignments at different levels of thinking often using Bloom's Taxonomy as a guideline.

Problem Solving or Thinking Skills Classes. The teacher meets regularly with a group of students identified as gifted to work through a number of scenarios/problems designed to develop the critical/creative problem solving abilities of the students. Such thinking skills are generally interdisciplinary in nature and usually beyond the objectives of the regular curriculum.

Learning/Interest Centres. Interest centres for younger students (interest groups for older students) provide enrichment for students who demonstrate early mastery/competence with required work. These centres allow students to explore in greater depth or breadth topics of interest introduced by the regular curriculum. In some cases, students themselves, may become involved in the development and production of the learning centre.

Seminars. When a topic of interest to a number of students has been delineated, the teacher (or one of the students) may invite a guest speaker into the school to meet with the group of students already interested in the topic. Here, the students may explore with the guest further involvement in the topic.

Mentorships. The student works with a resource teacher, media specialist, parent volunteer or community member to develop and carry out all or part of a project or task. This is a useful way to help students develop skills of production in a field and to develop career awareness.

Advanced Level Courses, Advanced Placement. For some exceptionally able students, the only appropriate way of enriching the school experience is by providing an accelerated program of study, either by full grade acceleration, or by subject acceleration. This may be done by moving the child into a higher grade with older children, by having the teacher teach multi-grades in the one room, or by arranging for a special teacher to teach an advanced program to a small group of students.

Through the use of distance education, gifted students in rural communities should be able to avail of the same opportunities as their urban counterparts to access advanced placement courses, thus giving these students a much needed challenge in their final years of high school.

Integrating Technology and Specific Instructional Strategies

Specific examples of how technology can assist an exceptionally able student in his/her program are provided below:

Thinking Skills Groups. Critical/creative thinking software will allow students who have finished assigned work early, to work at their own pace through creative problem solving activities.

Curriculum Compacting. Technology can now be used to pre-test in any number of skills areas, so that student time can be spent only on those skills not already mastered.

Seminars and Mini-Courses. When a school takes the time to prepare and present a seminar by a guest lecturer to a special interest group in the school, the benefits of that effort can be magnified through the use of teleconferencing to other schools. This is particularly helpful for exceptionally able students in rural schools who can benefit from resources not located in that area. This also applies to mini-courses which can be taught through distance education.

Independent Study. As a major area of endeavour for the exceptionally able learner, the independent project has always posed some difficulty in terms of finding the

necessary resources to do the work, as well as arranging the personnel and time. With today's information technologies, independent study is more manageable for the student and the teacher facilitating such a study. Additionally, the methodological skills needed to complete the work, particularly in the areas of research skills, word processing and using the Internet, often come very easily to such students.

SOFTWARE FOR EXCEPTIONALLY ABLE STUDENTS

Criteria for choosing software for high achieving students (based on Pattridge, 1994)

Choose software that:

1. Accommodates a wide range of ability levels
2. Is challenging and teaches/supports educational curriculum.
3. Develops higher level thinking skills.
4. Encourages additional research using the library, other software programs and/or the Internet..
5. Provides feedback

Note: You may wish to have gifted students participate on an existing school committee or form a student committee to preview and evaluate software. Refer to *Software Evaluation Form* in Appendix B.