

How Do I Do That?

Integrating Web Sites Into the Gifted Education Classroom

■ ■ by Kevin Besnoy

When gifted students enter the workforce, they will be expected to search Web sites, locate information, and compare it with information found in nonelectronic sources (Mioduser, Nachmias, Lahav, & Oren, 2000). In order to adequately prepare these students to be successful, teachers of the gifted must learn to harness the power of Web sites and create learning environments that mirror con-

temporary society (Siegle, 2004). Web sites are a rich resource that can be used to facilitate the learning, sharing, and creating of information. Not since the invention of the printing press has a development such as the Internet had such a revolutionary impact on how information is shared. More than ever before, individuals can share information on a global scale. Unfortunately, Web sites are underused in

gifted education classrooms (Siegle, 2005).

There is a paucity of research demonstrating the proper strategies for implementing Web sites into the gifted education classroom. As a result, the entire field faces inadequate preservice teacher training, insufficient staff development, and an absence of technology standards. In fact, the National Association for Gifted Children (NAGC) has yet to

establish Instructional Technology (IT) standards to guide gifted education classroom instruction. At the time of the writing of this article the word *technology* is only mentioned once in NAGC's (2000) program standards.

The IT field has developed empirically sound standards and strategies that dictate the integration of Web sites into the classroom (Hannafin & Hill, 2002). Regrettably, they are not specific to the field of gifted education. The purpose of this article is twofold: (a) to provide teachers of the gifted with a reference for adopting IT pedagogical standards, strategies, and tools, specifically Web sites, into the gifted education curriculum; and (b) to show gifted educators the need for research-based standards regarding the integration of Web sites into the gifted education classroom.

Defining Instructional Technology

Researchers declare that IT is an ever-changing field; thus, it is difficult to craft a simple definition (Arias & Clark, 2004; Reiser, 2002). In fact, during the last 45 years several definitions have been created and refined. A few experts argue that media is the most defining characteristic of IT; others believe that IT is a process used to solve problems (Finn, 1960), while others believe that IT is a systematic process of design and delivery (Reiser; Richey & Seels, 1994). Authorities now see that media, design, delivery, and performance all have an equal amount of defining influence on the field.

IT is divided into two areas: strategies and tools. Teachers that adhere to appropriate IT pedagogy will design systematic, purposeful,

learner-centered learning environments (Gustafson & Branch, 2002). Examples of IT tools include, but are not limited to: (a) computers, (b) Internet, (c) software, (d) multimedia, and (e) Web sites. By combining proper strategies and tools, teachers of the gifted can create stimulating classrooms that allow students to maximize their potential.

IT Standards for Gifted Education

The International Society for Technology in Education (ISTE) is a professional organization dedicated to improving the quality of IT integration into education. ISTE created the National Education Technology Standards (NETS) for administrators, teachers, and students. In addition to improving teaching practices, NETS also established student learning objectives.

Unfortunately, NAGC has no stated IT standards. As mentioned previously, the word *technology* is hardly present in NAGC's (2000) program standards. Thus, teachers of the gifted must rely on ISTE standards for guidance when utilizing IT to create learning activities and to measure student performance.

The NETS for teachers and students are divided into the following six broad categories: (a) Technology Operations and Concepts; (b) Planning and Designing Learning Environments and Experiences; (c) Teaching, Learning, and the Curriculum; (d) Assessment and Evaluation; (e) Productivity and Professional Practice; and (f) Social, Ethical, Legal, and Human Issues. NETS for students are also divided into six broad categories: (a) Basic Operations and Concepts; (b) Social, Ethical, and Human Issues; (c) Technology

Productivity Tools; (d) Technology Communication Tools; (e) Technology Research Tools; and (f) Technology Problem-Solving and Decision-Making Tools. Each category has performance standards for each grade level. According to ISTE, students must be taught how to use technology in order to succeed in the information age. Each of these categories provides teachers with guidelines by which they can plan learning activities. Teacher standards can be downloaded at http://cnets.iste.org/teachers/t_stands.html and student standards can be downloaded at http://cnets.iste.org/students/s_stands.html.

Benefits of Utilizing Web Sites in the Gifted Education Classroom

Web sites are robust IT tools. In fact, Web sites are the most powerful IT tool available to the gifted classroom because they are versatile and student-centered (Keane, 2002; Siegle, 2004, 2005). Web sites allow teachers of the gifted to differentiate the curricula, while at the same time giving students autonomy and responsibility for their own learning.

Teachers of gifted children should differentiate the curricula to meet their students' unique needs (Tomlinson, 2004; Troxclair, 2000). Researchers declare that differentiating the curriculum allows teachers to individualize classroom instruction for each student (Coleman, 2001; Stepanek, 1999). The purpose is to provide a rigorous learning environment that challenges students at their individual instructional level. Due to the accessibility of vast amounts of information, Web sites permit teachers to vary the depth and content of any lesson.

Incorporating appropriate IT strategies and Web sites helps teachers of the gifted to create student-centered learning environments. These strategies provide gifted students with the means to access, synthesize, and create new information (Scheffler & Logan, 1999). In this student-centered learning environment, the teacher no longer dispenses information; rather, student knowledge is created by “inquiry, critical thinking and problem solving based information accessed from a variety of sources” (Scheffler & Logan, p. 305). Moreover, the teacher of the gifted is creating a learning environment that mirrors the real world.

As stated above, gifted students must be exposed to authentic situations in which they are expected to synthesize multiple sources of information. By designing learning environments that utilize quality Web sites, teachers of the gifted provide their students with the opportunity to learn how to research information, compare it to prior knowledge, and create new ideas. Learning these practical, real-world skills empowers gifted students and increases their ability to maximize their potential.

Evaluating Web Sites

Before utilizing the power of Web sites, teachers of the gifted must understand that Web sites are only one instructional tool. In order to successfully integrate this tool, they cannot discard other proven teaching practices. However, they must also acknowledge a Web site’s teaching potential (Mioduser et al., 2000). In fact, courses and advanced college degrees are now available online. As the field of online learning begins to adhere to more stringent standards

and becomes increasingly mainstream, more quality learning opportunities will present themselves to gifted students.

IT strategies dictate that lessons be well-organized and strategically planned (Hannafin & Hill, 2002). Therefore, before teachers of the gifted can integrate Web sites into their curricula, they must evaluate them for quality, content, accuracy, and purpose. Mioduser et al. (2000) conducted a study that evaluated 436 Web sites that had a stated educational function to determine their pedagogical usefulness. The researchers found that only 33% of the sites included information analysis activities, 28% promoted inquiry-based learning, 4% expanded the learner’s knowledge, and 3% of the sites encouraged collaboration among individuals.

The results of this study demonstrate that not all educational Web sites are adequate for the classroom, let alone the gifted classroom. For that reason, it is imperative that teachers of the gifted evaluate the content of and process skills required by a particular Web site before infusing it into the gifted classroom. For teachers of the gifted to properly integrate the Web to “differentiate curricular options, instructional approaches, and resource materials” (NAGC, 2000), they must distinguish between appropriate and inappropriate sites.

Web Site Evaluation Guides

Several evaluation guides to aid teachers in determining appropriate Web sites for their classrooms are available online. One can simply type “Web site evaluation guide” into any search engine on the Internet in order

to find an evaluation guide. Unfortunately, the resulting large number of hits can be overwhelming and make it difficult to select one that is functional. Discussed below are two Web site evaluation guides in particular that are easy to access and straightforward to use.

Cyberbee.com. Cyberbee.com is a Web site that contains a variety of teacher and student resources. The Cyberguide Ratings for Content Evaluation can be downloaded for free from the Cyberbee Web site at <http://www.cyberbee.com/content.pdf>. This evaluation guide is divided into the following five categories: (a) First Look, (b) Information Providers, (c) Information Currency, (d) Information Quality, and (e) Further Information. Each category has between 2 and 11 yes/no questions that are designed to aid teachers in evaluating the quality and usefulness of any given Web site.

The evaluation guide helps teachers of the gifted to look at a Web site with a critical eye. Sample items include:

- *User is able to quickly determine the basic content of the site* (First Look),
- *The sponsor of the site is clearly identified* (Information Providers),
- *Latest revision date is provided* (Information Currency),
- *The site offers sufficient information related to my needs/purposes* (Information Quality), and
- *There are links to other sites that are related to my needs/purposes* (Further Information).

After answering all of the questions, teachers tally the number of yes/no responses and determine the appropriateness of the site.

While there is no set cut-off score for any Web site evaluation guide, teachers must weigh the positive and negative aspects of each site. There might be one element on a particular site that merits its use, such as a hard to find map, rare photo, or engaging multimedia. Conversely, teachers of the gifted might find one element that warrants the site's exclusion such as sexually explicit advertisements, broken links, or a slow Internet connection speed. When making the ultimate decision to utilize a specific site or not, the teacher must have a learning goal in mind and determine if that particular Web site will help students to be successful.

DiscoverySchool.com. Discovery School.com, sponsored by the Discovery Channel, is another teacher and student resource Web site. The Critical Evaluation of a Web site PDF can be downloaded for free at <http://school.discovery.com/schrockguide/eval.html>. There are three evaluation guides to choose from depending on the grade level of the audience (elementary, middle school, and secondary level). Teachers of the gifted can use each guide to evaluate a Web site based on visual appearance, content, and authority. The elementary and middle school has yes/no questions divided into two categories, combining content and authority into one category. The secondary school guide divides the yes/no questions into the three categories mentioned above. All three versions provide space for the evaluator to write a narrative evaluation of the Web site.

Following completion of all sections, a teacher can make an informed decision about the appropriateness of using a specific Web site as an instructional tool. Sample items include:

- *Does the page take a long time to load?* (visual appearance),
- *Would it have been easier to get the information somewhere else?* (content),
- *Are you positive the information is valid and authoritative?* (authority), and
- *Looking at all of the data you have collected above while evaluating the site, explain why or why not this site is (or is not) valid for your purpose* (narrative evaluation).

Again, a teacher will tally the responses and determine if or how to incorporate a particular Web site.

Criteria Specific to Gifted Education

Unfortunately, neither guide specifically addresses gifted children's needs. While teachers of the gifted should be concerned about the visual appearance, content, currency, and authenticity of a Web site, they also need to ensure that it meets NAGC's program standards. Thus, before designing a lesson that incorporates a Web site, teachers of the gifted must consider a few additional yes/no questions. The following have been adapted from the Curriculum and Instruction strand of NAGC's Gifted Education Program Standards (2000):

- Can the Web site be adapted to meet the varied instructional pace of all students?
- Does the Web site incorporate advanced content that facilitates critical thinking?
- Will the Web site meet gifted students' strengths and interests while allowing a sufficient ceiling for optimal learning?

These questions can be integrated easily with any Web evaluation guide. After thoroughly evaluating a Web site, teachers of the gifted can then determine whether or not to utilize it as an instructional tool.

Designing Lessons That Incorporate Web Sites

Incorporating IT tools, such as Web sites, into any lesson requires that teachers follow a systematic process. Many instructional designers insist that adhering to a specific instructional design model will enable teachers of the gifted to produce effective, efficient, and relevant instructional activities (Gustafson & Branch, 2002). According to Gustafson and Branch, there are several instructional design models that describe specific criteria that one should follow. However, in one way or another, they all incorporate the following five core elements: (a) analysis, (b) design, (c) development, (d) implementation, and (e) evaluation (ADDIE). This ADDIE model is the most widely used instructional design model (Gustafson & Branch).

Analysis

Before writing a lesson that incorporates Web sites, the teacher of the gifted must analyze students' needs. These can include the need to learn algebraic formulas, the differences between democracy and communism, cell structure, or literary style of William Shakespeare. According to Gustafson and Branch (2002), a major aspect of this stage is to select a worthy goal for gifted students to achieve, because it will influence other elements of the lesson.

Analysis also involves determining available resources. Teachers of

the gifted who have access to a computer lab would design a lesson differently than those with one, three, or five computer(s) in the classroom. Other resources to consider include, but are not limited to: (a) hardware capacity, (b) Internet connection speed, (c) student expertise, and (d) teacher expertise. Teachers of the gifted must accurately analyze their resources if they are to design lessons that appropriately infuse Web sites into the curricula.

For example, in an advanced 8th grade U.S. History class, one objective is for the students to learn about Lewis and Clark's exploration of the Louisiana Territory. The goal of this sample lesson is for students to describe the effects that the Lewis and Clark Corps of Discovery had on the idea of Manifest Destiny.

Depending on the particular classroom, available resources can differ drastically. As stated above, one teacher may have a classroom full of computers available while another may have only one computer. It is important to remember that no matter the situation, the goal will not change. However, what will vary, depending on each unique situation, is the design of the lesson.

Design

After analysis, the teacher of the gifted needs to design the structure of the lesson. This includes writing measurable objectives, detailing learning activities, and identifying specific Web sites (Gustafson & Branch, 2002). As with any well-organized lesson plan, the teacher of the gifted must create learning objectives and activities that enable students to meet the stated goal. Additionally, when incorporating a Web site, the teacher must select one

that enhances all of the lesson's learning activities.

It is easier to incorporate Web sites into the lesson when the ratio of computers to students is 1:1 as opposed to 1:25. However, in all situations the teacher of the gifted will have to creatively design learning activities that maximize technology and nontechnology resources. While the design of the activity will vary depending on available resources, the objectives of the lesson will remain the same.

For example, three learning objectives for the sample Lewis and Clark lesson are as follows:

- Students will be able to describe in their own words the 19th century American idea of Manifest Destiny.
- Students will be able to compare Thomas Jefferson's desire to expand America's influence across the continent with contemporary events.
- Students will be able to defend their opinion as to whether or not the 19th century American ideas of Manifest Destiny had a positive impact on American history.

Each of these objectives can be achieved in a classroom with 25 computers or just one. The difference between success and failure for either situation lies in the teacher's ability to effectively utilize all instructional tools, not just Web sites, to facilitate learning.

Regardless of the number of available computers, teachers of the gifted must consider design strategies that allow for flexible use of Web sites and other resources. These strategies include, but are not limited to: (a) creating multiple learning centers, (b)

designing cooperative learning groups, (c) incorporating the jigsaw method, or (d) creatively scheduling individual student computer time. The key to the success of each strategy is for the teacher of the gifted to have developed varied learning activities (i.e., utilized other tools) that permit students to meet the lesson's goal.

Development

To develop effective lessons that incorporate Web sites into the gifted education classroom, the teacher of the gifted must produce teacher and student resources for all of the learning activities. Hannafin and Hill (2002) state that teacher-developed materials will help guide gifted students through the lesson and enable them to meet the learning objectives. The teacher resources will also provide the teacher of the gifted with the necessary information to monitor, teach, and evaluate student progress.

Resources for gifted students should help to develop the process skills of knowledge, comprehension, application, analysis, synthesis, and evaluation (Roberts & Roberts, 2001). Examples for the Lewis and Clark lesson include, but are not limited to: (a) primary documents from Lewis and Clark's journals, (b) journals for students to document their own learning, (c) K-W-L charts, (d) maps illustrating Lewis and Clark's journey, (e) maps illustrating the total territory of the Louisiana Purchase, and (f) samples of 19th century Native American folk tales that demonstrate how westward expansion impacted their way of life. Certainly this is not a comprehensive list, but it does demonstrate the variety of resources that are required. While some might be included within a Web site, teachers also will need to

locate/create materials not available through the site.

In addition, teachers will have to develop materials that enable them to facilitate the activities. During any given lesson, teachers of the gifted are expected to observe learning to ensure that students are progressing toward the desired goal. They must also evaluate final products to determine if students met the required objectives (Hunt & Seney, 2001). These include: (a) pre/post assessments, (b) rubrics, and (c) checklists. As with any teaching strategy, teachers must be prepared to answer information and procedural-based student questions. Furthermore, they must always have backup materials in case there is a technology glitch such as downtime in the school's Internet access or computer failure. Teachers of the gifted should use temporary problems as an opportunity to teach and model good planning and coping skills.

Implementation

After analyzing the situation, designing the environment, and developing the materials, the teacher will implement the lesson. Having designed a learning environment that teaches students the skills necessary to succeed in the information age, the teacher of the gifted will act as a facilitator. Hannafin and Hill (2002) state that an appropriately created learning environment will help gifted students to meet the objectives successfully. The setting will direct students by "having them read the instructional materials, engage in instructional activities, produce responses, and receive feedback" (p. 77). In this situation, the teachers cease to be the dispensers of knowledge; rather, they guide students on their journey to discovery.

During the sample Lewis and Clark lesson, the teacher of the gifted will make sure that each activity, including the Web site activity, works as designed. In addition, it is the teacher's responsibility to monitor student progress and provide timely feedback on all student work. To help set a more authentic environment, the teacher could dress up as an early 19th century historical figure such as Thomas Jefferson, Sacagawea, Lewis, or Clark; have sound effects of people moving through the woods playing in the background; or bring in examples of early 19th century tools. The point is that the Web site is one tool of many that teachers of the gifted must utilize.

Evaluation

According to Gustafson and Branch (2002) there are three elements to evaluation: summative, formative, and revision. Summative evaluation requires the teacher to collect data to determine if students met the learning objectives. Formative evaluation involves collecting data to determine how to revise and improve the lesson. Revision requires that the changes be made according to the formative data (Gustafson & Branch).

At its conclusion, the teacher of the gifted must critically evaluate all aspects of the lesson. Hannafin and Hill (2002) state that this evaluation will allow the teacher to determine if students have acquired the necessary knowledge and skills as determined by the objectives and reinforced by instruction. Additionally, teachers of the gifted must also evaluate each activity's instructional effectiveness. Not only will the teacher gauge which elements worked, but he or she will also consider ways to improve the lesson.

At the end of the sample Lewis and Clark lesson, teachers of the gifted must determine if students met the stated learning objectives (summative evaluation). It is more accurate to measure total learning by administering a pre- and postassessment; however, gifted students must at least complete a postassessment. Moreover, teachers of the gifted must reflect on ways to improve and enhance the lesson's design (formative evaluation). Examples of formative evaluation include (a) the teacher reflecting on the effectiveness of each activity; and (b) students commenting on what they learned from each activity. Recruiting students' input empowers them to take ownership of their learning. Finally, teachers of the gifted need to look at the evaluative results and revised activities to ensure more efficient learning.

In terms of incorporating a particular Web site into the gifted classroom, the teacher cannot conclude its instructional quality until the students have completed the lesson. The teacher of the gifted must determine if the Web site had a positive impact on student outcomes. Furthermore, the teacher should reflect on how to improve the instructional quality. This might result in creating new student materials, finding a more effective Web site, or adjusting the design of the Web-based activities.

ADDIE Summary

Becoming comfortable with incorporating Web sites and following the strategies outlined in the ADDIE model takes time. Much like riding a bicycle, novices will at first fall. However, as riders gain confidence and expertise, they figure out how to balance themselves and eventually learn to ride smoothly.

Unfortunately, acquiring the ability to successfully adopt IT strategies and IT tools in the gifted education classroom is a difficult process. However, if the field is to remain relevant and continue to receive due attention by key decision makers, then teachers of the gifted must accept the challenge.

Final Thoughts

Teachers of the gifted must be willing to adopt IT strategies and incorporate IT tools. By doing so, they will provide their students with the necessary skills to succeed in contemporary society. Moreover, the field of gifted education must begin to develop empirically sound IT strategies and standards that dictate teaching in the gifted classroom. Future studies should investigate the frequency that teachers of the gifted infuse IT tools in the curricula, criteria for determining appropriate IT tools for the gifted classroom, practical strategies for implementing IT tools, and proper techniques for evaluating the effectiveness of IT tools on gifted students' learning. The outcomes of these studies will not only help advance gifted education pedagogy, but also will enhance gifted children's ability to maximize their potential. [GCT](#)

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