Using Hypermedia and Multimedia to Promote Project-Based Learning of At-Risk High School Students

Tracy Carr and Asha K. Jitendra

The term *at-risk* in this article refers to those students who are in danger of dropping out of school (Rodriguez, 1997). Often, these students have low self-esteem resulting from persistently low academic achievement. One possible reason for academic failure is a mismatch between the student's needs and the curricular expectations. Consequently, it is important to plan to meet individual student needs appropriately and minimize the rate of dropouts. Planning more appropriately requires individualization of goals and curricula.

One approach to individualized planning includes project-based learning, which is the integration of community service with academic skills and structured reflection (Cairn & Kielmeier, 1991). When real-world situations provide authentic learning opportunities, student learning is enhanced as the curriculum is made meaningful. Project-based learning, or service learning, in which students volunteer their time, effort, and skills to a social cause can be an effective method of learning for a variety of students, including students with disabilities (McPherson & Nebgen, 1991). For many students, service learning may lead to a heightened awareness of others' needs and provide the opportunity to actively contribute in a positive manner. For at-risk students, in particular, it is an opportunity to give, which can help them get out of the victim stance. Awareness of social issues within the school and the larger community may motivate students to contribute their time and knowledge. Also, when students give to others and are valued at a project-based learning site, they gain confidence in their abilities. Consequently, it increases their motivation and likelihood of staying in school and seeking post-secondary training (Correa & Repetto, 1996; Mann, 1987).

Hypermedia and multimedia are technological applications that can provide an engaging environment for learners to construct knowledge through the association of relevant and meaningful information prompted by project-based learning (Mendrinos, 1997). Hypermedia (e.g., the Internet) is a nonsequential computer-based technique that may be seen as an application manager (Woodhead, 1991) that allows for the arranging and rearranging of chunks or nodes of information based on a learner's needs and background knowledge (Borsook & Higginbotham-Wheat, 1992). The learner can search for information and make associations between and among topic areas as he or she explores links and nodes. Hypermedia presents information that is accessible to all types of learners (Anglin, 1995; Nielsen, 1995). For example, the combination of text, sound, graphics, and motion video arranged in non-linear, linked nodes in hypermedia allows learners to efficiently deal with large and disparate sources of knowledge. The extent to which a student can make interconnections of the material presented via hypermedia depends on several factors. The student's age and maturity, for example, may influence his or her ability to perform higher-order thinking skills (e.g., synthesizing, generalizing, analyzing). Multimedia (e.g., video, CD ROM, laser discs, audio tapes), on the other hand, provides linear stimulation that is not controlled by the learner.

Learning through hypermedia or multimedia and using authentic tasks requires learners to see the "rele-
vance of the knowledge and skill to their lives, and the leverage it provides in problems they see as important" (Cunningham, 1991, p. 13). Problem-based tasks in service learning may allow the learner to get immersed "in a situation which requires the learner to acquire the knowledge and skills relevant to solving the problem" (Jonassen, Mayes, & McAleese, cited in Boyle, 1997, p. 71). In the following section, we describe a project-based program in which at-risk students used hypermedia and multimedia to self-direct their learning.

Project-Based Program Description

In our project-based program, we used various aspects of the 8 Ws approach described by Lamb, Smith, and Johnson (1997) to help students investigate social issues and enhance project-based learning. The Ws are as follows: (a) Watching requires that students observe their project-based environment; (b) Wondering focuses on brainstorming and reflecting on initial information; (c) Webbing refers to the visual organization of relevant data; (d) Wiggling involves the twisting and turning of data to investigate underlying inferences; (e) Weaving is the integration of information and inferences; (f) Wrapping is the packaging of data and inferences (e.g., a slide show); (g) Waving refers to displaying the published product for the purposes of sharing and feedback; and (h) Wishing is the reflective process of the project and experience (e.g., "In what ways could we have done this project differently?" "In what ways do you wish this situation was different?").

Participants

Nine 10th-grade students from a suburban public school special education classroom participated in this program. Students were identified as having significant learning and emotional problems and were considered to be at risk for dropping out of school. The seven males and two females ranged in age from 15 to 19. Two of the students were Caucasian and seven were African-American. All were from lower- to middle-class socioeconomic backgrounds. In terms of their school status, two students were on probation at the time of the program, and three exceeded the legal number of absences and were close to losing credits for all classes. Participants' reading levels ranged from the third- to the ninth-grade.

Planning for and Implementing Project-Based Learning

The context of the project was a local homeless shelter for preschool-age children and their mothers. The objec-
students felt important, unique, and deserving of praise, and for some, it was the first time in their lives that they had felt this way.

Finally, students had to decide which position they would take and defend it with factual information from various sources. That is, students took a position and defended it with facts as they engaged in problem-solving processes that required the application and integration of higher-order information (Ennis, 1994). Next, the information was organized into a meaningful multimedia presentation using the Claris Works slide show application on a Macintosh computer, which integrates pictures, text, music, and graphics. In addition, students photographed each other's interactions with the children and mothers at the homeless shelter. After scanning photos or downloading them onto the computer, students selected six images for their slide show presentation (wrapping). Students worked diligently to gather information from the Internet, the library's CD-ROM database, and other sources for the slide show to be presented to an audience of their peers and school personnel (waving). In addition, students continually reflected on their project experience as they wrote in their journals (wishing).

Benefits of Project-based Learning

Service learning helped students realize that they could help someone else. The most obvious outcomes of this project were the students' sense of accomplishment and pride along with increases in self-growth (e.g., confidence, self-esteem, responsibility), attendance rates, and empathy for others. The final activity involved the students making a formal presentation to a wide range of audience members that included their peers, the principal, the superintendent, and the faculty. Students' success was reflected in their confidence and enthusiasm as they made their presentations. Additionally, the audience seemed fascinated with the information, and all students confidently answered a myriad of questions related to possible solutions to homelessness. All of a sudden, nine students who were used to failing showed that they could succeed. Each student demonstrated expertise on a specific topic. Each student formed an opinion. Each student felt positive about school. The interest and motivation to engage in the project seemed to contribute to the students' success in this program.

This program also met each student's Individualized Education Plans for reading, writing, and speaking. As students were engaged in the project-based learning, they continued to practice prescribed curricular skills...
(e.g., reading, writing) within authentic circumstances. For example, objectives for one of the nine students addressed improving adult and peer relations, writing five-paragraph essays with a point of view, and increasing reading rate, all of which were attained during project-based learning. In a classroom where homework and project completion were the exception rather than the rule, all nine students completed a five-paragraph essay on their project topic (see Figure 1 for sample). At the end of the project-based learning experience, the classroom was filled with artifacts of the students’ collective efforts. From brainstorming sheets to articles to photo layouts to five-paragraph essays, the students’ diligence to make learning meaningful was evident.

A variety of approaches was used to create the diverse presentations. Some students began with a random topic related to homelessness, and others chose pictures from the shelter to begin the story and get ideas for a topic. One student used his weekly journal reflections from our visits to the shelter to document his initial perceptions of homelessness, his experiences, and his new schema of the shelter. In summary, students positively benefited from this experience. Throughout this project, students felt important, unique, and deserving of praise, and for some, it was the first time in their lives that they had felt this way.

CONCLUSION

Focusing on student strengths and realistic post-graduation goals and skills may be the key to successful and meaningful educational programming. Student strengths became evident throughout this project-based learning experience, a notion supported in the literature. For example, Yoder, Retish, and Wade (1996) pointed out that as the student becomes an engaged learner of authentic tasks, strengths and basic skills in reading, writing, and speaking can be realized within the context of the project-based task. In this program, because the students were able to recognize that the role of the teacher moved from knowledge-giver to coseeker of knowledge, they became empowered. They realized that they were trusted and in control of their own projects.

Informal interviews and ongoing observations revealed that hypermedia, multimedia, and project-based learning allowed students to connect the new information with pre-existing cognitive structures as they explored, questioned, and sought answers. Hypermedia allowed students to independently seek answers, and project-based learning created an environment that supported diversified interests and led to the realization of individual goals. This finding lends itself to the notion that hypermedia increases the quality and ease of access to varied information (Woodhead, 1991). Finally, multimedia was seen by students as not only a tool to learn from, but as a tool to communicate understanding of a topic.

In addition, hypermedia and multimedia were particularly useful to motivate at-risk students because, as McPherson and Nebgen (1991) noted, these applications tend to elicit “multiple senses and kinds of intelligence, making learning more accessible” (p. 328). The interactive nature of hypermedia and the ease of multimedia not only enhanced student engagement and productivity, but also increased their ability to perform complex tasks (i.e., writing essays). These findings seem to support the notion that technology increases the abil-

Service Learning

When you work in a shelter, you must act and care for others. Service learning is about helping others through devotion and respect. Service learning means honesty, caring, and giving.

You need honesty when you work at a shelter and to work with people, because people ask you questions. By being honest, you can go a long way. By showing children to be honest, you will teach kids that to get respect they must give respect.

Caring is also important when working in a homeless shelter. If you don’t care for people, you will not get anything out of life when you give your heart to it. Most people don’t care if they have an impact or who they touch with their actions. However, people who do care get something back in return. Whoever we touch through our caring will look up to us in our own way.

People who have a lot to give have all the love to share with people. Those who give will know that all people are not bad and they will spend some time to help the ones in need. Without people to care, the shelter would not be there for people who need someone in their life.

All the time you spend with the KIDS will help them to know that people outside the shelter care for their well-being. It is important to show the kids the qualities of honesty, sharing, and caring so that they will grow up knowing important values. If you give all you can you may find out that you have a lot of friends out there.

Figure 1. Student sample of written essay on service learning.
ity to successfully perform more and more complex tasks, enhances motivation, and leads to changes in classroom roles and organization (Baker, Gearhart, & Herman, 1994; Means & Olson, 1994; Mendrinos, 1997).

In summary, students in this program developed confidence and autonomy as a result of the project-based learning, making it well worth the time and effort involved. Project-based learning is seen as an emerging educational practice that is important for all students, particularly the at-risk learner (Ioele & Dolan, 1992; Siegel, 1996; Yoder et al., 1996). As schools provide project-based learning experiences, it may be necessary to consider establishing an appropriate match between technology-based instruction and effective educational practices (Salomon & Perkins, 1996; Toomey & Ket-terer, 1995).

Persons interested in submitting material for Technology Trends should contact M. Raskind, University of Texas at Austin, Special Education Dept., SZB 306, Austin, TX 78712.

ABOUT THE AUTHORS

Tracy Carr, MEd, works for Epylon.com Corporation as a Web site trainer and is working on her EdD at Lehigh University in the Program for Curriculum and Instruction. Her current interests include effective instructional practices to meet the needs of students with high incidence disabilities. Asha K. Jitendra, PhD, is an associate professor of special education in the Department of Education and Human Services at Lehigh University. Her research interests include curriculum analysis, dynamic assessment, and effective strategies for teaching students with mild disabilities. Address: Tracy Carr, 645 Harrison St., Suite 200, San Francisco, CA 94107; e-mail: carrtr@yahoo.com

REFERENCES


