Web Places: Project-Based Activities for At-Risk Youth[1]

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This paper describes the development and evaluation of Web Places, a prototype web-based template system that allowed students at risk of academic failure to publish meaningful projects on the Internet. The objective of this study was to assess the feasibility of the Web Places concept in the context of at-risk education. Seven at-risk high school students used the prototype system to develop and publish a project on the Internet. Pre- and posttest data about the students' attitudes toward Web Places, learning, and technology were collected. The results indicated that Web Places was a useful tool for teaching and motivating the students. Web Places' potential for future development, evaluation, and application is discussed.

The number of students at risk for educational failure is increasing, and often, schools are unable or unwilling to accommodate them (Brown, 1986). However, at-risk students have the potential to succeed if their needs are recognized and addressed. At-risk children who are able to succeed despite their disadvantages can become adults with higher self-esteem and better qualifications for the workforce. Unfortunately, the number of youth is decreasing in proportion to the remaining population, while the educational requirements for jobs at all skill levels are increasing (Brown, 1986). These trends indicate that, to maintain our status as leaders in the global economy, we must ensure that a larger percentage of students gain higher levels of skills and knowledge.

Focusing on at-risk education may also help to reduce the magnitude of some social problems, as many of these problems are partially the result of inadequate education. The National Coalition of Advocates for Children's 1988 report states that failing to properly educate children could result in increased government dependency and serious financial and social burdens for American taxpayers (Wheelock, 1985). Society can work to avoid costly future problems by investing in the development of today's children (Ogden & Germinario, 1988).

This paper describes Web Places (**http://www.web-places.com/**), a system that was designed to contribute to the enhancement of at-risk education by providing at-risk students (and their teachers) with opportunities to participate in and publish educationally rich projects. For the purposes of this study, at-risk students were those who had less chance of

succeeding in school than average students do because of factors such as economic status, race, parent marital status, and family circumstances (these factors were provided to us by the Department of Education, who funded this project). User-friendly templates alleviated the technical burden of developing a web page and allowed students and teachers to concentrate instead on learning and producing instruction for others.

At-Risk Education

Teachers of disadvantaged students tend to focus almost exclusively on basic skills using traditional instructional methods such as whole-group lecture, repetitive drill-and-practice, and simple remedial exercises (Means, Chelmer, & Knapp, 1991; Blumenfeld, Soloway, Marx, Krajcik, Guzdial, Palincsar, 1991; Knapp & Turnbull, 1990). Using these instructional methods exclusively is uninteresting to most students and results in reduced educational opportunities, which in turn leads to learned helplessness, decreased motivation, and decreased chances of success (Means, et al, 1991). More importantly, at-risk students often are not given the opportunities to learn the advanced skills needed for problem-solving and critical thinking. All students, but especially at-risk students, must have opportunities to participate in interesting and challenging education that focuses on advanced skills as well as basic skills.

Education research indicates that project-based learning activities can help at-risk children learn and practice a variety of skills and improve their attitudes toward learning (Means, 1994; Duttweiler, 1992), inducing them to actively participate in their own learning. The most beneficial project-based learning activities include six characteristics: opportunities to explore domains of interest; active, interactive, and attractive instruction; project orientation; collaboration with peers; opportunities to act as learner as well as designer; and opportunities to practice and develop fluency for advanced skills (Means, 1994; Duttweiler, 1992).

Integrating technology with curricula can enhance at-risk education (Means, et al, 1993; Means & Olson, 1994). For example, technology can help provide authentic learning environments, better opportunities for collaboration, and interesting, innovative learning environments. Technology also allows students easier access to information and more efficient ways to organize and display information. Students who have the opportunity to use technology are also becoming more prepared for the job market, as an increasing number of jobs are becoming technology-oriented. Finally, students who use technology in school tend to improve their school performance and problem-solving abilities and increase their motivation in reading, writing, and mathematics (Bialo & Sivin, 1990; Reed, 1996). All of these factors have the potential to contribute to an increased self-esteem in at-risk students. An increasing number of educational programs and schools are integrating technology with their curricula, especially to fulfill the objectives in the Goals 2000: Educate America Act and President Clinton's Technology Literacy Challenge. Two examples of such programs include the **Accelerated Learning Lab** and Sweetwater Union High School's **Advanced Curriculum through Technology**.

Web Places

Web Places is a web-based template system in which students, without needing special technical skills, are guided in producing and publishing their own projects on the web. This paper describes the development process of a prototype Web Places template and describes the results of its feasibility study. Although template designs are used in many contexts of web page development, they are most often used to aid in the development of home pages rather than educational projects. The Web Places concept is unique because its templates provide explicit organization and structure for project content, allowing students to produce quality educational projects. Therefore, students can not only publish web-based projects without special technical knowledge, but they can also learn advanced skills associated with their projects (e.g., problem solving or critical thinking). This system allows teachers to attend to more complex student issues, such as group dynamics or discussions about potential topics. In addition, the nature of the Web Places concept provides students with a learning environment that includes the six characteristics (listed above) of an effective project-based learning activity. Web Places' applications of these characteristics are described in more detail below.

Opportunities to Explore. The web already provides the opportunity to browse diverse sources of information, participate in simulations, and view and contribute to on-line artistic creations. Web Places extends this opportunity by allowing users the ability to enter and organize information obtained off-line. Students have the freedom to explore any domain and to create on-line environments that can be explored by others.

Active, Interactive, and Attractive Instruction. The combination of the web's interactive nature and Web Places' student-directed nature allows at-risk learners to both view and create interesting, attractive instruction.

Project orientation. Traditional approaches to at-risk instruction often do not provide the learner with a project orientation (a meaningful context for learning). As a result, at-risk students sometimes have difficulty understanding the applications of their learning activities. The project-based instructional approach used in Web Places is designed to help students form a project orientation. By allowing students to create original, interesting projects, Web Places has the potential to help students feel empowered and perhaps motivated because they understand the goal and importance of the learning activity.

Peer Collaboration. Collaborating with other students to produce a product promotes individual responsibility and facilitates shared expertise and specialization (Scardamalia, Berieter, McLean, Swallow, & Woodruff, 1989). Collaboration and communication skills are crucial for success in all aspects of society, especially the workplace. In addition, collaborative learning allows students of varying abilities to learn from each other as they work together to produce a common goal. Collaboration is an integral part of Web Places because students must work with others in the group to develop their project.

Learner as Designer. Learning is more meaningful when students function as producers as well as consumers of information (The Cognition and Technology Group at Vanderbilt, 1994). Students who teach other students take an active role in learning and develop better academic and social skills. In Web Places projects, students not only learn about their chosen domain by conducting research, but they also teach about their domain by selecting and designing instructional materials.

Focus on Advanced Skills. Embedding basic skills into real-world contexts that involve advanced learning activities can help students learn advanced skills as well as basic skills. The project-based learning environment offered by Web Places allows students to use and develop many different types and levels of skills, such as teamwork, research, writing, or organization.

Conceptual Design of the Web Places Template Structure

In our conceptual design, the heart of a Web Places installation is an Intranet/Internet server that hosts Web Places software and project data. The server may be a dedicated computer in the school, or it may run on an Internet service provider's system. Students and teachers interact with the server using standard Internet clients running on desktop computers in the schools or at home. Materials are entered into the project using a variety of portable equipment and facilities available in the school itself. The Internet server also serves as the school's link to the Internet, providing students with access to materials on the web, serving as a publication vehicle for projects, and linking the installation to a central Web Places community site, Web Places Central.

Once the template is selected, it is configured for the project according to the number of students involved, the volume of material, time spans, and other pertinent data. As shown in **Figure 1**, the configuration includes one or more interactive, web-based project manuals, an interactive web-based facilitators' guide, a repository for project materials, and a web-site for publication of the materials. All of these elements are resident on the installation's Intranet/Internet server.

Developing the project involves simply filling in the infrastructure with content. A dynamic, web-based project manual created at the beginning of the project guides students in this work. The project manual combines instructions on content development with interactive forms for entering that content. As materials are entered into the project's repository, a publication system creates a web site for the project. Through a system of access restrictions, the site is first reviewed by the project team and then by teachers or administrators. When deemed ready for publication, the site is opened for general access, publicized through search engines and links to related sites, and included as a link in Web Places Central. The conceptual design of a project template consists of the elements listed in **Table 1**.
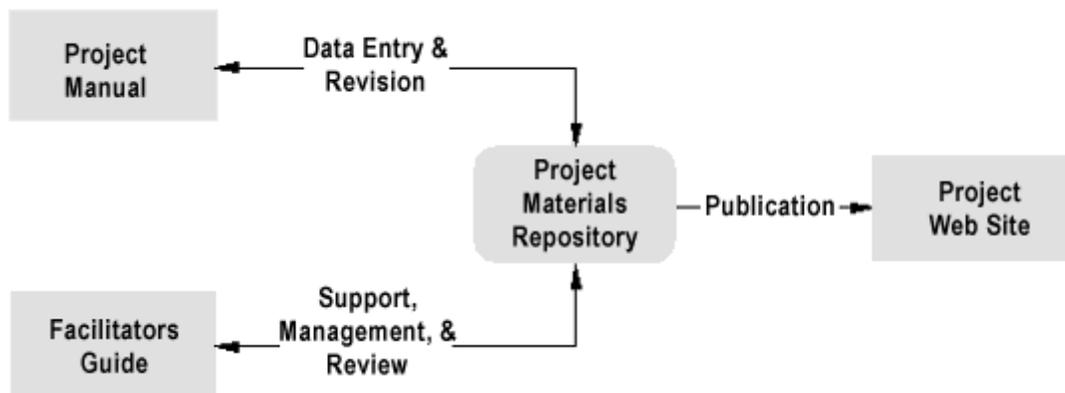
Figure 1: Web Places project template components

Table 1: Elements of a Web Places Template

Design Element	Description
General goals	Types of projects supported by the template (e.g., virtual art galleries)
Project development process	Steps to be taken in planning the project, collecting materials, editing, publication, and maintenance
Materials	Types of materials that make up the project content, their formats and the vehicles used to collect them
Implementation requirements	Hardware and software requirements, staffing, administrative procedures
Possible project configurations	Ways the project can be configured for different numbers of students, different time frames, etc.
Project manual structure	Structure of the Intranet site used to guide project development and collect parameters
Instructor's guide structure	Structure of the Intranet site used by teachers to oversee and support project development
Project web site structure	Structure of the web site used to publish project content
Materials repository structure	Structure of the database used for storage and retrieval of project content

Prototype Design of the Web Places Template Structure

A prototype version of the template was developed and implemented for the current study. (A partial version of the conceptual design shown in **Table 1** was implemented as the prototype. The implementation provided the core elements, the project manual, facilitators' guide, project web site, and materials repository in a single configuration. Each of these elements was skeletal, with rough placeholders instead of finished text and graphics.) This implementation provided the project manual, facilitators' guide, project web site, and materials repository in a single configuration. **Bitmovers Communications, Inc.** developed this template based on BitProject[2], a system for developing web-based collaborative information-sharing environments. BitProject provides the capability to equip a web site with data forms of the sort needed for Web Places' templates. These forms allow users to enter items of a particular type, edit those items, and view the items added by others. Access to bitProject's data is controlled by a system of groups and privileges that allow for the implementation of the concept illustrated in **Figure 1**. Thus, Web Places' prototype project web site gave the public viewing permission for all areas of the web site and permission to contribute to the discussion forums. The project manual gave students permission to contribute items to the site, edit or delete their own contributions, and view the contributions of others. The facilitators' guide gave teachers permission to edit material throughout the project. BitProject associated each participant with his or her privileges so that students and other participants were automatically given the permissions appropriate to their roles.

The graphical design of the web site was developed in parallel with the prototype template. At the end of the project the two were integrated so that the project web site offered an attractive graphic design. The same design was presented in the template, allowing editors to see how their material would appear to viewers.

Research Objective

The main objective of this study was to determine the feasibility of implementing the Web Places concept in an at-risk educational setting. The following research questions were formulated to evaluate this objective.

1. To what extent does the Web Places concept attract and engage at-risk students?

2. What kinds of materials and content do at-risk students develop for Web Places projects?
3. Do the core Web Places elements (**Table 1**) provide sufficient support for development of Web Places projects?
4. What critical issues arise in the course of Web Places implementation?
5. What are the effects of Web Places (in its prototype implementation) on individual students and the school as a whole?

Method

Participants.

A local high school was used as a test site for the prototype development. The representative from the school selected four female and five male students, aged 15 to 17 years and of diverse ethnic backgrounds, to participate in the Web Places project. All nine students were considered at-risk for reasons such as economic status, race, parent marital status, and family circumstances. These characteristics were provided to us by the United States Department of Education. Six of the nine students were participants in a technology magnet program hosted by the school. Time constraints caused one student to withdraw from the project. Another student was expelled from school and, therefore, could not continue with the project. Thus, seven students participated throughout the entire project.

Procedure

A pretest-posttest research design was used to evaluate the research questions outlined above. Before introducing the students to the concept of Web Places, we administered a structured interview (developed in-house), a computer experience questionnaire, and the Self-Esteem Index (Brown & Alexander, 1991) to each student privately.

The structured interview was designed to collect information about each student's background information, perceptions about academic competence, and attitudes about school, learning, technology, and the Web Places project. The interviews took approximately 40 minutes each to complete. While the interviewers had a set of prepared questions, students were not discouraged from exploring other topics. As part of the structured interview, students were asked to complete a series of six questions (Self-Assessment of Relevant Academic Skills, also designed in-house) designed to assess their perceptions of academic competence. Specifically, students were asked to rate, on a 1-5 point Likert scale with anchors, their confidence in problem solving, research, organization, planning, project work, and teamwork.

The computer experience questionnaire was designed to collect information about the students' usage of computers. Using a 1-5 point Likert scale with anchors, students rated their frequency of computer use, confidence in computer abilities, and enjoyment derived from computer use. Items representing these entities were composited to form pretest and posttest estimates of individual frequency of use, confidence, and enjoyment.

The Self-Esteem Index is a standardized measure of self-esteem normed against an 8-18 year-old referent population (Brown & Alexander, 1991). It consists of 80 items that provide a general measure of self-esteem and sub-indices quantifying familial acceptance (FA), academic competence (AC), peer popularity (PP), and personal security (PS). Measures of internal consistency ranged from .80 to .93 on these indices. The general SEI score is the best overall measure of a person's self-esteem.

At the completion of the project, we also conducted a focus group to gain more information about the students' and the teacher's perception of the project. The focus group questions encompassed project concept development, template design and use, research, and general experiences with the project. Two researchers conducted the focus group and five students attended.

Results and Discussion

The results obtained for each research question are described below.

Question 1: To what extent does the Web Places concept attract and engage at-risk students?

The results of the focus group provided information about the students' perceptions and ideas about the Web Places project. The students' comments from each of the discussion's subdivisions are described below.

Project Concept Development

The students chose to develop a project on the media's portrayal of issues that affect teenagers, including the treatment of gay students, teenage pregnancy and daycare, standardized tests, and school uniforms (this concept is discussed in more detail under **Question 2** below). The students had mixed feelings about the project selected. One student mentioned that the project concept was "boring at first" but more enjoyable later. All of the students stated that they enjoyed being a part of the concept development process; however, they indicated that they had too many choices and would have benefited from more guidance. They suggested that being presented with more structured topics of study in which to develop projects would have helped them in the concept development process. During this phase of the project, the teacher who organized the student group did not have time to give them a great deal of guidance. Therefore, it may be beneficial in the future to integrate projects with classroom activities, where it would be part of the teacher's job to provide guidance.

Template Design and Use

All of the students agreed that the templates were easy to use. Although they could not suggest many ways to change the templates, one student suggested the developers capitalize on collaboration opportunities by providing the capability for site visitors to enter their own materials into the templates. Another student mentioned

that he would have liked a spell checker integrated with the templates.

Research

The students stated that, at the beginning of the project, they felt somewhat uncomfortable with the interview and questionnaire process. However, once they became more familiar with the team members, they felt more at ease. Although the students did not mind completing the computer experience questionnaire, they questioned the relevance of the SEI and expressed discomfort at having to complete it.

General Project Experience

Three themes emerged from this portion of the focus group.

Personal experience. Several of the students indicated that working on the project helped them improve their research skills and learn about new topics. The project also gave them the opportunity to meet new people. The students felt that they learned the importance of time management. In addition, they enjoyed being exposed to an office environment, learned work-related skills, and learned new perspectives on their topics.

Teamwork. The students stated that, initially, they were apprehensive about working on the team because they did not know each other. Once the project began, however, most of the students enjoyed working with the other team members and learned about the importance of teamwork. Some students learned to be more patient with others and to be more open-minded. One student admitted that he might not have felt as motivated to work if he had not been a part of a team.

Ownership. All of the students had spoken to or shown the project to their peers, teachers, and parents. Most of their peers expressed interest in working on similar projects. The students' teachers and parents were proud of the students' work and effort.

Question 2: What kinds of materials and content do at-risk students develop for Web Places projects?

To promote feelings of ownership and empowerment in the students, we guided them in designing their own project concept. We provided the students with several project ideas and criteria for an acceptable project. The criteria were that the project should be fun and interesting for all team members; unique and creative; academically relevant; appropriate and consistent with their school's academic philosophy; useful to others in the school, the community, and beyond; interactive; practical; and replicable.

Over the course of three sessions, the students produced three possible project ideas: censorship, the effects of media on behavior and attitudes, and technology and art. By the third session, the students had decided to pursue a project on the effects of media on attitudes and behavior. The students were particularly concerned about the media's portrayal of their school and of social issues that affect American teenagers. With this concern in mind, the students chose to study how four issues are portrayed in the media. These issues included the treatment of gay students, teenage pregnancy and daycare, standardized tests, and school uniforms. Each of these issues was of particular concern at the test school. For example, the school's daycare center for children of students is a source of considerable controversy in the community. The students' ideas for the site were considerably more in-depth and significant than those we envisioned.

The nature of the chosen project required that the students collect a variety of multimedia materials reflecting two sides of the issue for each topic (a point and counterpoint). Students collected stories from newspapers, magazines, and the Internet, and also investigated the portrayals of each of the topics in the entertainment media. In addition, students developed analyses of and reactions to their findings. The final published project can be viewed at **Web Places**.

Question 3: Do the core Web Places elements provide sufficient support for the development of Web Places projects?

The partial implementation was functional and allowed materials to be entered through the project manual, reviewed via the facilitators' guide, and published via the project **web site**. **Table 2** summarizes the prototype implementation of each template element, and **Figure 3** illustrates the project web site.

Table 2: Elements of prototype template

Design Element	Description	Prototype Implementation
General goals	Types of projects supported by the template (e.g., virtual art galleries)	The general goal of the template was to present points and counterpoints (using text and supporting media) on chosen issues.

Project development process	Steps to be taken in planning the project, collecting materials, editing, publication, and maintenance (e.g., virtual art galleries)	The project development process consisted of four steps. First, a set of four issues was identified. Second, materials were gathered that make up the content of the site. Third, the materials were entered into the student guide at the web site. Fourth, the site was reviewed and published. The result of this process is available at **Web Places**.
Materials	Types of materials that make up the project content, their formats and the vehicles used to collect them	The required materials consisted of several examples of the media's treatment of an issue (e.g., a newspaper article) to support the students' points and counterpoints, a student-generated reaction to or analysis to each example, and ancillary materials such as web links, student interviews, and video clips.
Implementation requirements	Hardware and software requirements, staffing, administrative procedures	Implementation requirements for the site development were minimal. Text materials could be entered through any browser. Graphics, video, and sound were digitized and added to the site by the site developers (BitMovers, Inc.).
Possible project configurations	Ways the project can be configured for different numbers of students, different time frames, etc.	The template could be configured for any number of issues and could accept contributions from any number of (authorized) contributors.
Project manual structure	Structure of the Intranet site used to guide project development and collect parameters	The project manual allowed students to add and edit content to the web site and is identical to the project web site, with the addition of a single form that students can use to edit and/or add topics.
Instructor's guide structure	Structure of the Intranet site used by teachers to oversee project development	The instructor's guide was identical to the Project Manual. However, an individual logging on as an instructor can edit any contribution, whereas a student can only edit her own contributions.
Project web site structure	Structure of the web site used to publish project content	The project web site was the published version of the project. The structure of the project web site was hierarchical (see **Figure 2**). A Home Page provided an overall introduction to the site. Visitors could then choose a particular issue to investigate and, within that issue, browse any of its topics. Each topic consisted of a point, counterpoint, and supporting links or media. A discussion forum on each issue was also available where visitors could voice their reactions.
Materials repository structure	Structure of the database used for storage and retrieval of project content	The database was hierarchical in form and reflected the structure of the materials.
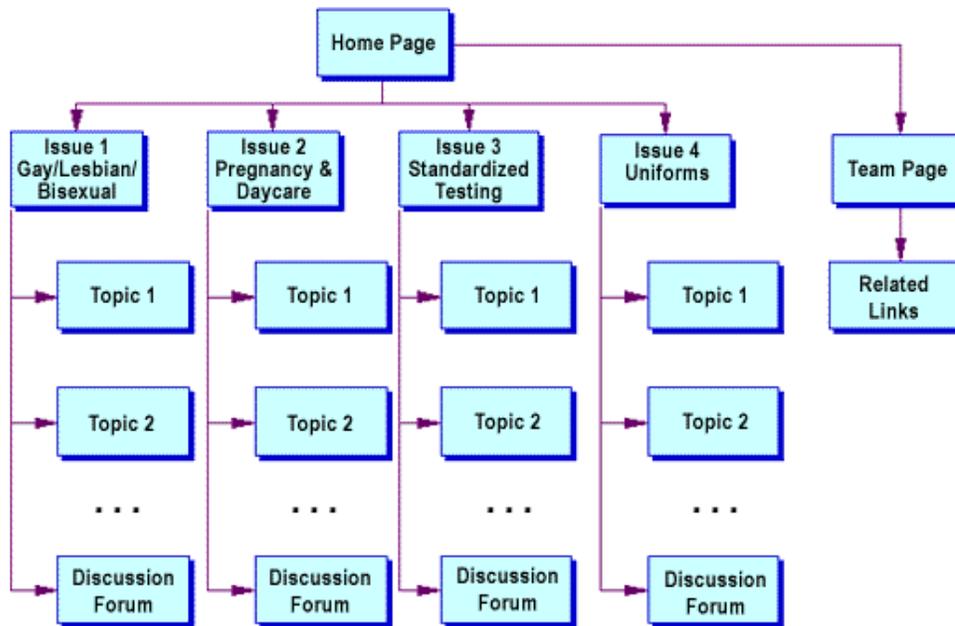
Figure 2: Project web site structure
The main forms in the site are shown in Figures 3 and 4, which show the project web site and the project manual.

Figure 3: Project web site
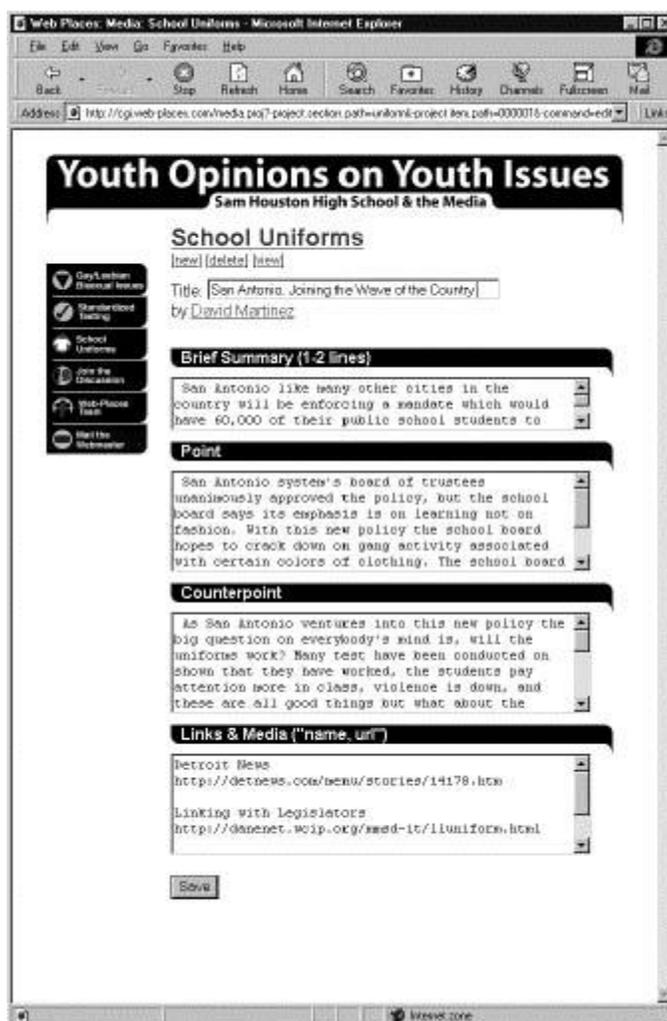
Figure 4: Project manual

Question 4: What critical issues arise in the course of Web Places implementation?

By examining the processes that the students used to deal with the project development process, we gained considerable insight into the issues that arise when working with at-risk students and the strengths and weaknesses of the initial design.

Although the students were given a preliminary task list to help them assemble folders with relevant research materials, the students did not completely understand the task and were not able to adequately prepare for the next meeting. Therefore, we developed specific goals for the students' project and assigned specific tasks to each student. The students felt that they had a better understanding of their goals and began to conduct research and collect materials. Students were given a Task Inventory Form to help them stay organized. This form allowed the students to categorize their sources and describe the relevance of their research. Time constraints and general confusion among the students prevented them from collecting an adequate amount of quality material. As a result, the group scheduled a supervised trip to the local public library where the students were introduced to the library's automated search facility and taught basic research skills. While this visit improved the quantity and quality of materials collected, students still had difficulty analyzing and abstracting raw materials into the larger framework of the project. However, project-related time constraints required that students begin data entry. The students spent two days entering materials into the template. On these occasions, we provided guidance on how to improve the quality of

student input (e.g., how to structure paragraphs and provide evidence). Under this direction, students were better able to produce quality work.

Lessons Learned

The issues described here have implications for the future design of Web Places. First, the students involved in this study were busy people. A serious problem in the implementation of Web Places, or in any program designed to enhance at-risk students' academic experiences, will be allowing time for these activities. The next version of Web Places will involve projects that can be incorporated into existing curricula, so that students can have scheduled time for their projects and receive more teacher guidance.

Second, the students had serious concerns about complex issues. Participating in a project in which they could study those issues provided them with an orientation for their learning and allowed them to practice advanced skills, such as research and writing. Similar projects that focus on more trivial issues may not be as attractive or beneficial for at-risk students.

Finally, at-risk students cannot be expected to come to projects with all of the research skills needed to complete them. The next version of Web Places will offer extensive support in the form of research guides for both students and teachers. It will also contain tools such as connections to appropriate search engines that make project research easier.

Question 5: What are the effects of Web Places (in its prototype implementation) on individual students and the school as a whole?

Qualitative data were collected from the structured interview and descriptive statistics were calculated for the remaining measures. Due to the small group sample, calculating inferential statistics was deemed inappropriate.

Structured Interview

This section provides an aggregate summary of the interview results, separated by the instrument's subdivisions.

Background Information

Before the beginning of the project, each student discussed a wide variety of interests and extracurricular activities, including church choirs, sports, the National Honor Society, computer activities, and school-sponsored expeditions. In addition, many of the students worked at part-time jobs or volunteered at organizations such as nursing homes or park maintenance facilities. Because the students were already active in extracurricular and volunteer activities at the beginning of the project, little change in activity was observed between the pretest and posttest interview sessions.

Perceived Academic Competence and Attitudes toward School

In general, the seven students involved in Web Places enjoyed school and considered themselves competent, hard-working students. Five of the seven students were members of the technology magnet school, a program they considered challenging and rewarding. Favorite classes included Visual Media, English, math, and various computer classes. Several students planned to attend college, and one student planned to join the Air Force. The students did not express a change in attitude or perceived academic competence between pretest and posttest interview sessions.

Attitudes toward Technology

All seven students were comfortable using computers before becoming involved with the Web Places project and regularly used them for schoolwork, games, and e-mail. The students agreed that computers make schoolwork easier, and some indicated that computers allow people equal access to information. The students stated that, although some of their teachers are timid about using computers, most are enthusiastic about them and use them in many aspects of teaching. In fact, the teacher who organized the student group was the coordinator of technology magnet school and had an enthusiastic attitude toward computers. The structured interviews did not reveal a change in attitude toward technology between pretest and posttest sessions.

Project Expectations and Perceived Benefits

The students got involved in the Web Places project mainly to learn about computers, the Internet, and technology. In addition, the students wanted to do something that would help improve their school's image, which they perceived as negatively distorted. Other reasons included receiving recognition, having fun, facing new challenges, meeting new people, and improving communication skills. The students perceived many benefits from working on Web Places. For example, they indicated that they learned to do research, work on a team, and manage their time. They also learned about the issues they chose to investigate and gained new perspectives about them. In addition, they learned the benefits of technology, met new people, got exposure to an office environment, and learned job-related skills. Finally, the students felt that the project helped to educate people about their chosen issues and helped to improve their school's image.

Structured Interview: Self-Assessment of Relevant Academic Skills

Although the students reported project benefits during the interviews, the Self-Assessment of Relevant Academic Skills demonstrated a slight reduction in confidence in problem-solving, research, organization, planning, project work, and teamwork skills over the course of the study (see **Table 3**). Two potential explanations seem plausible for this finding. First, at posttest, some of the students were busy studying for the state's standardized achievement test and final exams. Many were involved in several extracurricular activities in addition to Web Places. It is possible that the students

were simply overburdened at the time the questions were asked. It is also possible that the students had unrealistic perceptions about these skills. The Web Places experience required them to plan, research, synthesize, and organize content with other team members. Perhaps the demands of this situation caused them to rethink their previous answers.

Table 3: Self-assessment of relevant academic skills

	Problem Solving		Research Skills		Organization		Planning		Project		Teamwork	
	Pre	*Pst*	*Pre*	*Pst*	*Pre*	*Pst*	*Pre*	*Pst*	*Pre*	*Pst*	*Pre*	*Pst*
1	4	4	5	4↓	5	4↓	5	5	4	4	5	4↓
2	4	4	5	4↓	3	3	5	5	5	4↓	3	2↓
3	3	3	2	2	4	3↓	3	4↑	3	3	4	4
4	5	5	4	4	2	3↑	3	4↑	4	4	4	5↑
5	4	3↓	3	4↑	3	3	2	3↑	4	3↓	4	4
6	4	4	4	4	5	5	4	4	4	4	5	4↓
7	5	4↓	5	4↓	4	3↓	5	3↓	5	4↓	5	5

Shaded areas reflect differences in pretest-posttest responses.

↓ designates a decrease in a respondent's confidence.

↑ designates an increase in a respondent's confidence.

Computer Usage, Confidence, and Enjoyment

As a result of the sample selection procedures employed in this study, the students scored high on the computer experiences indices at both pretest and posttest (participants were primarily from the technology magnet school). In general, there was a small, but consistent, decrease in computer use, confidence, and enjoyment. This decrease is not likely due to the introduction of Web Places. Rather, it is most likely linked to changes within the school regarding computer use. School officials placed severe restrictions on all computer use, especially student e-mail and Internet access, as a result of several student pranks in the school. Reported usage of various forms of software declined from pretest to posttest. Despite this decline in use, student ratings of the enjoyment of e-mail and the Internet in general remained unchanged. It seems these findings are related to systemic changes and not to the introduction of Web Places.

Self-Esteem Index

It was proposed that the introduction of Web Places would facilitate improved self-esteem by providing the students with a sense of ownership and purpose.

Because all of the students on the Web Places project were considered at risk, their self-esteem scores were expected to be low (see **Figure 5**). This was generally not the case. The overall total self-esteem scores (percentiles) on the pretest ranged from 37 to 99; however, most students scored above the 50th percentile. In general, self-esteem scores increased from the pretest to the posttest. The overall total self-esteem scores (percentiles) on the posttest ranged from 58 to 99. Overall scores on the academic competence (AC) and peer popularity (PP) subindices showed the largest increase from pretest to posttest. Overall scores on personal security (PS) decreased. It is possible that working on Web Places helped increase the students' feelings of academic competence because they constructed a meaningful project and helped increase their feelings of peer popularity because they successfully collaborated with others in the group to produce a quality project. Perhaps months of doing homework and extra projects, taking standardized tests and finals, and doing extracurricular activities caused stress and lowered their sense of physical and psychological well being.
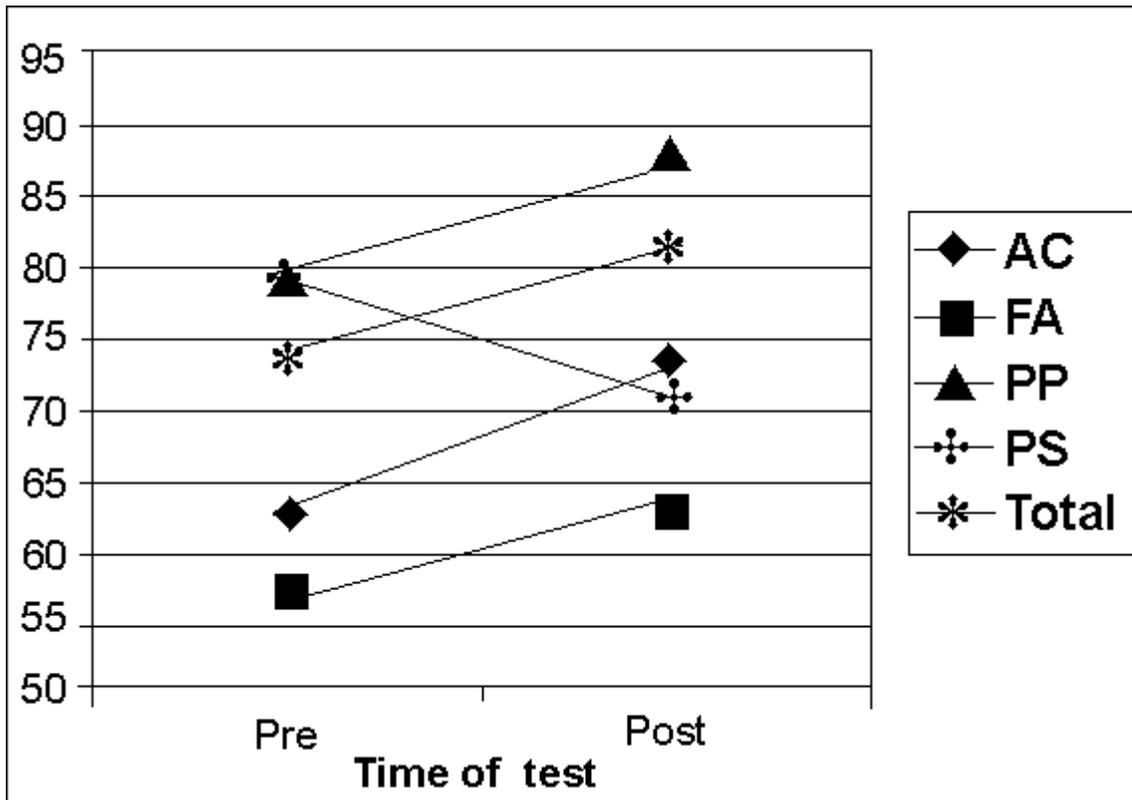
Figure 5: Average self-esteem scores by scale.

Conclusion

Web Places integrated technology and education by encouraging students to use technology to publish a meaningful and educational project about the effects of the media on issues important to teenagers. In addition, Web Places provided students with the opportunity to collaborate with other students they may not have previously had the opportunity to contact. As students used Web Places and benefited from these advantages, they felt that they improved their advanced skills (such as research, writing, and teamwork) and self-esteem by participating in meaningful projects.

The next phase of Web Places development will address the issues encountered during the prototype development. For example, future implementations will integrate a wizard, a search tool, an improved system for collaboration, and more flexible and sophisticated data entry and revision tools. In addition, future Web Places projects will be integrated with curricula and incorporated as class activities. Students will still be able to choose their specific project, but their teachers will choose the domain in which they work. In addition to increasing the amount of guidance students receive, integrating the project with class activities may promote effective peer tutoring, as more heterogeneous groups can be formed.

Future work will also incorporate a more robust research plan, using a larger number of subjects, a control group, and more Web Places templates. The number of templates will continue to grow and be added to Web Places Central, a main site serving the Web Places community.

If successful, Web Places will become a nationwide, self-sustaining community dedicated to expanding the range of project-based educational activities. This study demonstrated that Web Places shows promise in fulfilling its short-term goal of providing an effective mechanism for improving the chances for at-risk youth to succeed in school.

Notes

1. This material is based on work supported by the U.S. Department of Education under contract number RW97076118. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views or policies of the Department of Education.

2. **BitProject** - is based on Frontier, a cross-platform scripting system. BitProject, in its next version will be XML compliant and therefore provide all benefits of next-generation web browsers.

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