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Web Information System for Somers High School

An Interactive Qualifying Project Report
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by

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Abstract

In this project, a database-driven Web Information System was implemented for Somers High School in Somers, Connecticut. The purpose of this study was to show that computer technology can be beneficial to educators and to students when properly used as a pedagogical tool. This project provided the school with a simple but effective system that increased student use of online resources and simplified the process of planning for teachers.

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1. Introduction

The effectiveness of computer technology in the classroom is a subject of debate amongst policy makers and professionals in the education field. Acquiring and implementing computer technology requires a large number of resources. Therefore, proponents of using technology in the classroom must justify their cause by showing that computer use does actually have a positive effect on student achievement. Many studies have been conducted in support of this argument, but most have inconclusive results. This is because many of these studies do not take into account other factors that may affect the results, such as teaching methods, accessibility, student and teacher morale, and curriculum changes required for incorporating newly acquired technology into the current system.

1.1 Purpose

The purpose of this study was to assess the qualitative achievement of students using computer technology, in such a way that the study did not impose itself on the current curriculum. In order to accomplish this goal, a Web Information System, similar to the Blackboard system used at WPI, was implemented for Somers High School, in Somers, Connecticut. The system includes an interface that is intuitive and lends itself to sharing educational information via the internet. The system promotes the effective use of technology in an educational setting. It also promotes proper pedagogical use of computers among the faculty. It is our hope that use of this system will become widespread throughout Somers High School in the near future, helping teachers and students alike.

1.2 Literature Review

The literature review provides background information on the current state of the use of technology in the classroom. This background information details various studies that have been conducted and the results of those studies. By including this information, we are making the case that simply having technology in the classroom is not as important as how the technology is used to facilitate learning. In each of these studies, the curriculum must be modified in some way to incorporate technology as a tool for learning.

1.3 Methodology

The next section in this report outlines the methodology used in incorporating the Web Information System into the Somers High School educational system. Using this methodology, we were able to integrate the Web Information System into the Somers High School web site, making the site useful as an interactive way for teachers to present information to students. The system was integrated into the existing school website, so that teachers and students would have little trouble using it. The system is universally available to all of the students at Somers High School because the school has a library full of computers that are available for student use. The methods used to collect and analyze data relevant to this study are also outlined in the methodology section.

1.4 Project Scope

This study was limited in that its results do not contain quantitative data representing actual student achievement based on the implementation of the Web

Information System. This is true for a number of reasons. Firstly, we did not have access

to actual student records for comparison due to the fact that student confidentiality

prohibits us from gaining such access. Therefore, the results of this project are in the

form of a professional assessment by one of the teachers involved in using the system,

and from survey results taken from students who used the system, regarding the

perceived value of the system. Mr. Carlos Mezger, the Somers High School teacher

using the system, gave us his perceptions regarding the effect of the system on his

students in terms of grades, ease of use, and how they liked the system. Secondly, this

study was also limited in that it did not compare differences between students with

varying degrees of access to computer technology. Somers High School is well-equipped

with a number of computers available for student use. Therefore, computer access was

not a particular concern of this study. Because of this, our study did not compare the

results of students who have access to computers at home versus those who do not have

this access. The methods used in this study do not provide a way to correlate use of the

Web Information System at home with qualitative student achievement because we did

not know which particular students had computers at home and which students did not.

1.5 Results

This study gave us qualitative results in the form of surveys, ideas, and perceived

benefits. The survey questions were formed so that we could determine how all of the

students, teachers, and faculty perceived the effect of the Web Information System on

their work at Somers High School. We examined pre- and post-survey responses to help

us draw conclusions. In our interviews, we asked questions and recorded an interview in

order to determine what the teachers and faculty had to say about the system. The feedback from the interviews helped us draw conclusions and decide how the system should be altered so as to be more tailored to Somers High School's needs.

2. Literature Review

2.1 Disadvantages of Implementing Computer Technology in the Classroom

The benefits of using technology, specifically computers and the internet, to accelerate and facilitate students' learning, are seemingly obvious. Many argue blindly that computers are the future and that every student should be fluent in computer use in order to avoid being left behind. This common societal belief has left administrators and teachers in primary and secondary education trying frantically to supply modern technology to students. Some schools are even cutting fundamental programs such as music in order to be able to afford new computers for their students. In 1996, school administrators in Mansfield, Massachusetts, favored spending $333,000 on computers over funding proposed teaching positions in areas such as art, music, and physical education. Other schools have made similar decisions. Proponents of computer technology may argue that these changes are worth the cost because of the vast array of resources computers can provide. As history has shown, whenever new technologies are made available, proponents make promises that the technologies will revolutionize education and traditional teaching. This has happened with the telephone, film, television, and radio. Each was promised to become an indispensable part of the educational system, yet none of the aforementioned technologies has actually delivered on this promise.[1] Are computers destined to share a similar fate? Answering this question may be much more complex, because computers provide a level of interactivity and versatility not available in older technologies. The role of the computer in the educational system is a difficult one to determine; there are many factors to consider,

such as availability, skill level of user and administrator, and the educational aspect being measured. Several studies present inconclusive results because the studies are either too broad or they are trying to affect too many factors at once. What most of the authors of these studies fail to recognize is that computers, like all technologies, are simply tools, and unless teachers are provided with proper training, these tools are useless.[2]

The main disadvantage of computer-learning is that the computer itself is a costly machine. Average computer prices are at the $1500 mark, with state-of-the-art computers costing between $2000 and $3000. To create just one computer lab consisting of mid-range computers for 30 students would cost around $45,000. This, of course, is not including the cost of internet connectivity or external hardware or even monitors. Unfortunately, many schools do not have this amount of money in their budgets and so other programs or expenditures must be cut in order to provide computer equipment to students. Often, some of the first programs to go are music and physical education, both of which are integral to creative and social development in students. With these costs in mind, it is imperative that there be obvious and documented benefits that are worth such sacrifice.

2.2 Advantages of Implementing Computer Technology in the Classroom

Computers have the potential to revolutionize the way students learn. This is because of the vast array of resources available through media such as the internet, and because the computer is extremely versatile in its application. Computers can be used for a variety of purposes, such as word processing, communication, viewing multimedia, and

conducting research. Businesses use computer software for many different things; from storing transactions, to accounting, to accessing and changing databases.

Word processing software is a tool that can help students do their work more efficiently. Already, word processing has become standard in education curricula. It has been shown that using a word processing program improves students' writing. This is because the word processor comes with various tools such as spelling and grammar checks, margin and spacing controls, and formatting tools, which allow students to quickly spot errors and easily fix them. This motivates students to write more and to revise what they have already written. With word processors, students are more willing to experiment with different phrasing and word choices than they would be if everything had to be handwritten. Writing improves as students write more, and word processing encourages this behavior, so word processing leads to more coherent and creative writing. This, of course, is not to say that simply giving a student a word processing program will automatically improve his writing. Proper instruction is a necessary element in harnessing the benefits of this technology. A common method used by teachers both properly introduces the word processor and deals with the issue of not having enough computers to accommodate the number of students. This method involves the teacher first instructing students in proper use of the word processor. Students are then given a writing assignment that must be handwritten first. Next, each student can, one at a time, enter his work into the computer and make necessary revisions. Students are then able to write without the technology crutch, yet are still able to be more creative and precise by use of a word processor. Therefore, student writing is improved on the whole.[3]

It is necessary that all students be skilled in computer use before they enter America's competitive job market. Many companies now require basic computer skills as prerequisite for employment. Though some jobs require little computer use and employers are willing to provide on-the-job training, many jobs now require more advanced skills, such as using a database and communicating via electronic means. Recent statistics show that 54.2% of American businesses use some form of computer technology to help workers do their jobs better and more efficiently. These jobs can range from using a touch-screen computer at a fast food restaurant to administering servers and developing applications in an Information Technology environment. With this in mind, it is necessary that even students who do not plan to pursue higher education in the form of college or technical school still have at least a basic knowledge of computer use and its applications.[4]

College students are part of a demographic that uses computer technology on a frequent basis. Most college students in the United States are either required by their curriculum to use computers or simply do so to make given tasks simpler. In 2001 it was estimated that 78.5% of college students were required to use a computer to complete various tasks. Out of those students, 77.7% also used their computers at home for other tasks.[5] If students learn how to use this technology in high school or at a younger age, they will be better prepared to use it in college. If a student has no familiarity with computers through his high school career and then is required to use one on the job or in college, he will be at a disadvantage compared to those who already know how to use the equipment.

2.3 Case Studies

Here we present several case studies that have taken place in schools in different parts of the world. In each case, researchers studied what had been done at the school and drew conclusions regarding the effectiveness of using technology to increase student learning. Background information and results from these case studies are described in the following sections.

2.3.1 Case Study: Ruffwood School

Ruffwood@home is a project in which the Ruffwood School, located in the Northwood neighborhood of Kirkby, England, loaned computer equipment to the families of students in the school. The equipment included 100 new computers, web cams, printers, and internet access. This equipment was loaned to residents who live in an area that was lacking in computer technology.

The equipment was installed in August 2001. Since then, students have shown improvements in their homework grades, in their motivation to do work, and in their computer skills. With computers and internet access at home, the students' work is of a higher quality than it was before. The students talk with each other through email and MSN Messenger, making it easier for them to discuss work outside the classroom. The students are even involved in building Ruffwood@home's website and helping with other areas of the project.

This project integrates regular coursework with online search instruction so that students can learn effective ways to find material relevant to their courses. Homework can be retrieved online if a student is unable to attend school for the day. Each student

and parent is given his own email address through this system. Some of the students and parents involved in this project had never used a computer before the project was initiated, but now they use the internet daily. Some of the students who had used computers before even taught their parents how to use one. This turned out to be very rewarding for the students, allowing them to show their parents how school has taught them to use newer technology.

People from the school's district have become e-mentors for the students, facilitating the students' learning by simply giving them the opportunity to talk to someone online. The e-mentors aren't there only for the students, however; they also help the students' parents learn how to use computer technology. Ruffwood@home also has a mobile laptop service that allows other people in the community to get training on computers and to have access to the internet. This system has helped out people in the neighborhood of Kirkby in many ways over the years since it was first implemented. It has made it possible for an agoraphobic to gain access to information and people over the internet. It has allowed a 15-year-old girl with two children to do her schoolwork from home. It has helped people living in a retirement home to learn how to use computers and the internet through the mobile laptop service.

These are just some of the problems that can be solved through a system such as Ruffwood@home. All of the students who were loaned computers gained access to the internet and computer technology that they otherwise wouldn't have been able to afford. The project has also helped out the parents of these students, as they gained the same access to the technology as did their children. This project was set up in a neighborhood in which there were many obstacles to scholastic achievement. The greatest academic

improvement is shown in areas like this because most of the residents in the area cannot afford to buy computers and therefore do not normally have access to the resources computers provide.[6]

2.3.2 Case Study: Milken Exchange

The following is a study conducted by the Milken Exchange to assess the efficiency of the implementation of technology in the classrooms of a West Virginian school. A team of educational researchers, including Professor Dale Mann of Columbia University and Professor Charol Shakeshaft of Hofstra University, conducted a study of how computer technology could help students. The team took a look at West Virginia's Basic Skills/Computer Education (BS/CE) program, which was designed to improve basic student skills and provide teachers with complete training on the utilization of computers in the classroom. This ten-year program is the United States' longest running state program for improving education with technology. Forty eight percent of the teachers involved in this system said that it was the key reform that lead to greater achievements in reading, math, and language arts. This system works well because the teachers are thoroughly trained in the technology. These teachers use technology in ways that allow their students to either learn new things or to learn new ways of doing old things in a more efficient manner. Teachers help the students use technology to advance their critical and creative thinking, improve their reading and writing, and improve their math skills.

The BS/CE program has also proven to be cost effective. It doesn't cost nearly as much as reducing class size or implementing other popular interventions to increase

students' abilities, as Dr. Lew Solmon, senior scholar and senior vice president of the Milken Family Foundation, discovered. The program proved to give students in rural communities and low-income families equal opportunities to use technology. It also allowed girls to learn how to use technology more easily than before, equalizing the gap between boys' and girls' knowledge of computer technology.

There are a few reasons why West Virginia's BS/CE program has been so successful in aiding the learning process. Having computers inside each classroom, rather than isolating the computers in labs, helps students gain basic computer skills and increases the confidence of teachers using the technology to instruct their students. The technology was integrated into the existing system, making it a means for learning what was already being taught in school. Also, the teachers were trained to use computers to educate students through a detailed, comprehensive training program that demonstrated effective use. The study's main result was that, if the teachers aren't trained correctly, the whole program could be rendered completely useless.

There are some warnings that the researchers gave along with this assessment. The BS/CE program was implemented before computer technology was all that popular or powerful. It is much harder for schools to implement a system like this with the technology out there today, unless they use the proper mechanisms for training teachers and only use it in proper places in the curriculum. This is because today's technology has more utility and therefore is more complex. This particular system was designed exclusively for West Virginia's school system. To implement this specific system at another school, the system would have to be modified to include the school's current

curriculum requirements in its design. Otherwise, the system may be useless or may even have a negative impact on the school in which it is used.[7]

2.3.3 Case Study: East Rock Magnet School

East Rock Magnet School in New Haven, CT, is another school where computers have influenced the daily activities of the students. In 1998, there were three or four computers in every classroom for students in kindergarten up through sixth grade, and one computer in each classroom for grades 7 and 8. Each teacher was also given a computer that was connected to the internet. In 1994, the technology coordinator of the school, Domenic Grignano, implemented a school-wide network. He ran after-school training sessions for teachers in order to show them how to use the new technology effectively. Grignano observed that teachers, on the whole, need more training than students to be able to use a piece of software effectively. This is because they haven't had as much experience with computers as the students have. Also, since the teachers are older, they don't learn as quickly as the students, making the training for teachers take more time. "Truthfully, the kids in general pick up new things on the computer faster than the teachers, but the teachers are doing well, too," Grignano noted. It took nearly two years of training to bring the entire faculty to an acceptable level of expertise with the computers. The teachers are not using computers as their sole method of teaching, however. "We're using technology as a tool to reinforce learning that is taking place in the classroom," Grignano observed. He trains the teachers to use new software as it reaches the market; he tells them how to use it and for what purpose. The teachers at East Rock Magnet School do not simply assign homework via computer for the sake of

forcing computer exposure on students. Rather, they implement software either found on their own or suggested by Grignano as a supplement to the material that is taught in each course.

Students in East Rock Magnet School have shown improvement in their writing since the implementation of the computer network. Sending emails and using word processors that highlight spelling and grammar mistakes help the students learn how to write properly without having to always be supervised by a teacher. The students' attitudes toward doing schoolwork have greatly improved since they introduced this new technology to the school.

2.3.4 Case Study: Kent Center School

Kent Center School in Kent, CT has computers everywhere. Each and every seventh and eighth grader has a laptop that they carry around with them. The school bought all of these computers and loans them out to students once they reach seventh grade. The students are encouraged to use the laptops at home as well as at school; they use these laptops in both English and math every day. They turn in their math assignments on floppy disks, allowing the teacher to view their answers through his own computer. When the teacher grades the assignments, he simply puts each student's grade on the file that was handed in along with any comments about the assignment. Students are also supposed to put their notes on the computer and turn in a condensed version at the end of the semester. During English class, the students save a file in their English folder that lists each assignment. Students use many different programs at this school, including Microsoft Word, Excel, and Power Point. They don't use the computers for

everything at Kent Center School, however. The computer is simply used as a tool to aid the students in learning, as opposed to being at the center of the curriculum. The students still enjoy the same activities as their parents did years before: reading aloud, discussing math problems, and conducting lab experiments.[8]

2.3.5 Case Study: Greeneville School System

As CNN reported in 2000, technology is playing a larger part in schools such as one in Greeneville, Tennessee, than it has in the past. Both Greeneville Middle School and High School are learning about and dealing with technology in a new way.

The high school has a course called the Cisco Networking Academy. This is an online course that takes a year to complete, teaching the students the basics of network installation and repair. The middle school spent $90,000 in the year 2000 to make a technology lab. Students can take nine week courses here to study a lot of different things about computers, such as computer aided design and robotics. The students attending both these schools are very active with computers and technology. They have made websites, looked at the news, and researched many topics online. There are many technology-based jobs out there today, and these students will be better suited to acquire one of these jobs. The students are even allowed to work at the school with this technology over the summer or after school. They can help run new network cables, fix computers, install new software and hardware, and do many other jobs that may not be the most fun, but will help them get a good job in the real world.[9]

2.3.6 Case Study: ETS Policy Report

A study sponsored by *Education Week* and conducted by Harold Wenglinski in 1996 brought about an important conclusion: technology is effective in the academic realm when teachers are trained to properly implement it in their teaching methods. Wenglinski comments on the results of other studies conducted in the same field and reports that much of the data collected does not seem to show any true correlation between technology use and student achievement. This is because the studies that he is speaking of measure advancement simply as the number of computers that are available in the classroom. "We don't know how many teachers really know how to use [computers in the classroom] (there are no assessments of teacher capability here)," he states. Wenglinski believes that it is the implementation rather than the mere availability of technology that is important in teaching.

The actual ETS study was conducted to find a relationship between students' use of technology and their achievement in mathematics. The study was conducted using the 1996 National Assessment of Educational Progress, which is a national database containing information regarding student accessibility to computers, frequency of computer use, and differences between student computer use based on the student's race, gender, and economic situation. The analysis of the study produced several conclusions. Wenglinski found that students using math games in the classroom achieved better academic results than students who didn't use the games. He also found that professional development of the faculty in utilizing appropriate educational software lead to greater student achievement. The correlation between professional development of the faculty and the achievement of the students can be shown because the study also found that

student computer use at home without teacher instruction actually had negative results. Therefore, students who achieved higher results were more likely to have the necessary knowledge to use computers effectively for educational purposes rather than for extra-curricular purposes.[10]

2.3.7 State of Technology and Education in Other Countries

Schools in Argentina have been using computer technology in their classrooms for some time now. When the technology was first introduced, the school systems took on more of a "buy now, then see what the uses are" approach. After seeing that this approach wasn't very efficient, the schools began to figure out exactly what computers could be used for before buying them. Once a use was determined, the school would purchase whatever technology was needed to fulfill its needs. Raul Dorfman, who studied Argentina's approach to computer technology, said "Using computers makes sense only within an integrated educational project connected with the balance and potential of the local, regional and international community." This means that, in order for computer technology in the schools to be effective, schools must connect with each other and share what resources and knowledge they have so that all schools can benefit. School computer systems were being funded by municipalities and independent sources, though Argentina aspired to be fully connected someday. If the schools isolate themselves from other technology, they won't be able to use the technology they have in the most productive way.[11]

Taiwan has also been using computer technology in the classroom for a number of years. In 1994, Taiwan formulated a plan that would give all junior high schools the

same strategy for teaching technology. In 1998, the curriculum was changed so that there was a new subject entitled "computer". This course is required for every student in junior high school. There are also twelve other courses that deal with computers, ranging from computer graphics to word processing to computer ethics. These additions were made to the curriculum so that students would have at least basic computer skills once they graduate from junior high school. It can be difficult to keep such a curriculum up-to-date, since computer technology changes so rapidly. Taiwan's curriculum is built such that none of the courses rely on any particular computer hardware or software and, if new hardware or software is acquired, the underlying curriculum remains the same.[12]

South Africa has been taking steps to put computer technology in the classroom. The state decided that computer technology would be most useful for mathematical and scientific applications, as this is where the students would benefit most. They began using the TOAM drill-and-practice facility. TOAM is a computer company focusing on Information Technology. This was mostly used to teach students mathematics, but was also used to teach the students how to speak English as a second language. The TOAM system did not encourage students to interact with each other while learning mathematics. The students also had very little interaction with their teachers while using the TOAM system. Junior high school students were subjected to many drill-and-practice routines in order to teach them how to use computer technology so that each student would have a background in computers for his senior high school courses. Independent organizations, such as The Schools Computers in Education Group (SCEG) also helped the school system with its computer technology. Teachers learn how to use computer technology through SCEG and then pass it on to their students. Since the teachers are acquiring

proper training for certain computer applications, they are passing down their knowledge in a professional way. The Cape Educational Computer Society (CECS) is another independent organization that helps schools. CECS focuses on teachers and students in schools for the disadvantaged, so that they can learn the same basic computer skills as everyone else.[13]

2.3.8 Conclusion of Case Studies

As one can see, integrating computers in education has obvious benefits to student learning and therefore is worth the expense. However, while simply supplying technology to students will show little improvement, proper training of faculty and students in the area of computer use will yield great results. This is because the faculty will then have the knowledge to implement technology into their pedagogy effectively, while students will be enabled to efficiently use the resources available to them.

3. Methodology

3.1 Proposed Advantages of Implementing a Database-driven Web Information System

A database-driven, web information system, similar to the Blackboard system used by many colleges (including WPI) can be an effective system for learning if used properly. Unfortunately, such systems are only widely implemented at the college level, as high schools are generally unable to fit such a commodity into their annual budgets. The system that was designed by this group, although not as fully functional as commercial systems made by companies such as Blackboard, Inc., was designed to be cost-effective and easy to use. This encourages teachers and students of all skill levels to use this resource. The system promotes constant computer use, due to the fact that all assignments and many resources are being stored online. This, in effect, forces students and teachers to become familiar with using the internet. The Web Information System also has a familiar feel to the students because the technology has been retrofitted into the current Somers High School website, which has the additional benefit of promoting the use of the other resources that are already on the website. The resources on the current website have been generally overlooked in the past because students have not been compelled to visit the site and therefore have not been aware of what resources are available. According to Mr. Mezger, the Somers High School website has been, up until this point, more for parents and the community than for students, because the students are believed to have little interest in learning outside of school. This will hopefully change in the future as the Web Information System creates an interactive and useful environment

within the Somers High School web site. It is the belief of the faculty at Somers High School that this system will become a greater asset as it becomes more widely used.

3.2 Pre-Implementation Analysis Methods

Before implementing the Web Information System, we created three surveys to be answered by various constituents of the school system. One of the surveys was administered to the students. Copies of the survey were handed out prior to Somers High School students having access to the Web Information System. The surveys contained questions pertaining to the students' computer use and their opinions on the addition of a computer-based learning tool into their classes. We also created a survey for teachers at the school. The purpose of the teacher survey was to assess the level of comfort amongst the teachers regarding the inclusion of a computer-based system into the current curriculum and to determine which features would be most valuable to the teachers who would be using the system. The third survey was to be given out to the administration and the office staff who would be posting announcements and general school information on the website. However, we were unable to gain access to the actual Somers High School website. Therefore, only the pre-survey was administered because it was later decided that the high school administration would not be using the Web Information System.

3.3 Building the Web Information System

This section will outline how the core of the Web Information System was built. It will also outline some of the benefits and shortcomings of using the methods that we

employed in building the system. Specifically, it will outline the technologies used, how the pages in the system function, and some of the differences in the code underlying each of the user interfaces.

3.3.1 Technologies Used to Build the Web Information System

The Web Information System was built using Microsoft Active Server Pages (ASP), Microsoft Access databases, and Sun's Javascript technology. We chose Microsoft Visual Basic Script (VBscript) for coding server functions in the ASP pages. The Javascript is used in the client-side portion of the pages for form control and page aesthetics. Each ASP page in the Web Information System contains VBscript code that connects to one or more of the databases mentioned in the previous section. Doing it this way makes it possible for each page in the system to receive information about which user is currently using the page. Otherwise, the system would not be able to keep track of which database records to display. It would then be necessary for the user to login to each page in the system, which would create extra work for the user. This would completely undermine the efficacy of the system since it would be very tedious to re-enter login information every time a new page is loaded. Once a page is loaded, it connects to users.mdb, a database which contains all of the users' information. The page also checks for form data that may have been sent from a previous page. If form data is present, the page then searches users.mdb to find a user that matches the user's data passed from the previous page. Once the user's credentials are matched to the fields in users.mdb, the page continues to load and can then process requests given to it. There is a security benefit in using this method to pass user data: the form data passed into a page

is read and processed using VBscript, which is used as a server-side script and is therefore invisible to the user. Thus, a person with malicious intent would not have access to these values. Since none of the pages will function properly without user credentials, the said person would not be able to bypass the faculty login and tamper with the system by simply knowing the URL of other pages in the system. Also, since the VBscript is invisible to the user, it is impossible for a user with malicious intent to view or modify the inner-workings of the system. Another security benefit of using this method to store data is that end users do not have direct access to the databases. All data must be entered via web forms, which do not contain database field names. Malicious users therefore cannot store erroneous data in the databases. Legitimate users also cannot accidentally tamper with data input from other users. All of the web pages and databases referenced in this document can be found on the CD titled *Web Information System Source Code CD*, which accompanies this document.

The one caveat of our choice of technology used to build the system is that it must be hosted on a server that supports Active Server Pages. Unfortunately, most servers that run an operating system other than Microsoft Windows NT, Microsoft Windows 2000 Server Family, or Microsoft Windows 2003 Server are unable to host Active Server Pages. While building the system, we found that Somers High School has a Unix-based server and cannot support Active Server Pages. However, Competitive Edge Services, a professional web-hosting company based out of Grafton, MA, donated permanent web space for this project. Currently, the Web Information System is being hosted on a Windows 2000 Server supporting Active Server Pages. The administrators at Somers High School are working on acquiring ChiliASP, which is a software program that gives

Unix servers the ability to host Active Server Pages. Once this software is running on the Somers High School server, the Web Information System will migrate to their server and be completely contained within the school system. This, however, did not happen within the timeframe allotted to building this project.

3.3.2 Organization of the Web Information System

Each user who connects to the Web Information System has a unique login name and password combination that allows access to the system. Each of these combinations is stored in a database created specifically to hold user information. This database, named users.mdb, contains two tables. The first table, titled *Courses*, contains information pertaining to the courses offered at Somers High School. This information is organized into these fields: *ID*, *CourseNumber*, *CourseName*, *CourseTerm*, *Teacher*, and *Department*.

The *ID* field is the default primary key for the table. The *CourseNumber* field holds the identification number given to the course by the school. Information in this database field is necessary to pull the proper records for the teachers and the students. The *CourseName* field holds the description for the course. The description contained in this field is merely for informational purposes, since high school students generally do not refer to a course like *English 10* as *Course 328*. This information is not used by the system to return any information; it is used to display course titles for the end-user. The *CourseTerm* field contains the availability of a particular course. It can contain the following values: all, spring, or fall. This field is important for the teachers' user interface because it will only show the courses for which they are currently responsible.

Some confusion is mitigated by using this method. The Teacher field contains the ID number of the teacher who is teaching the specific course stored in the record. This is necessary in order for the system to be able to match teachers with their respective courses. The *Department* field contains the department to which the course belongs. The significance of this field is that the system opens a specific database for each department. Each department database will contain less data than it would have had we designed a system in which one large database contained all of the users' data. It is unlikely that the server will reject any requests due to high traffic of a single database, and even if one of the databases does become corrupted, it will be easier to fix separately than if all departments were part of one database. Departments are less prone to change, which is another reason for organizing the database by departments rather than by courses.

The other table contained in users.mdb is *Users*. This table contains the information pertaining to each user that is allowed into the system. The information in this table is responsible for matching users to the proper user interface as well as for displaying adequate information within the user interface. The *Users* table contains the following fields: *ID*, *FirstName*, *LastName*, *UserName*, *Password*, and *Department*.

The *ID* field is the primary key for the table and is automatically incremented whenever a new user is added to the system. The *FirstName* and *LastName* fields are self-explanatory; they hold the first and last name of the user. The *UserName* field holds the username that allows the user into the system. The suggested convention for usernames is the user's first initial and full last name. However, the administrator can use another naming convention if he deems it appropriate. The *Password* field contains the password with which the user can authenticate into the system. Each of the users that

were entered into the system was given a password that was randomly generated using an online script. The passwords were generated as four lower-case letters, two numbers, and then two upper-case letters. The *Department* field holds the department to which the teacher belongs. This field must match the department name given in the *Courses* table for that course to be available for the teacher to modify.

The department databases are named according to the possible values that can be stored in the Department fields of the tables in the users.mdb database. All of the department databases follow a template. Therefore, they are all the same except for the filename given to each department's database. Each department's database contains one table called *Data*. Within the *Data* table are the following fields: *ID*, *CourseNumber*, *CourseName*, *Teacher*, *InfoType*, *DataName*, *DataLink*, and *DueDate*.

The *ID* field is the primary key for the *Data* table. It is automatically incremented each time a new record is added to the database. The *CourseNumber* field contains the course number that corresponds to the course to which the data in the record belongs. The system pulls assignments from the department database based on the course number stored in this field. The *CourseName* field holds data that is displayed in the user interface. The *Teacher* field holds the ID of the teacher who entered the record. The *InfoType* holds information pertaining to the type of data entered. This field can take one of two values, *assignment* and the course number. Assignments are displayed as such in the student user interface. Resources were intended to be specific to a department rather than to a specific course. However, after we presented the system to the staff at Somers High School, Mr. Mezger suggested that the resources should be specific to the course and so the system was redesigned to accommodate this suggestion. The *DataName* field

contains the actual data to be pulled from the record. This can be an assignment or a description of a resource. Assignments can be linked to outside sources; and resources will also be linked to outside sources. These links are stored in the *DataLink* field of the database. Assignment due dates are stored in the *DueDate* field. Records that hold resources will most likely not have data stored in this field.

3.3.3 User Interfaces

Users of the Web Information System gain access through links on the Somers High School website. The system is designed for two kinds of users: faculty and students. Each user type has a separate link to follow from the Somers High School website. Faculty users are separated into teachers, administrators, and the system administrator. The interface for each of the faculty categories is determined by the information stored in the user's record in the users.mdb database. The faculty link brings the user to a login page. The user must then enter his unique username and password. The system then checks the provided login information against all of the records in the *Users* table of users.mdb. If the system cannot find the provided username and password combination in the database records, the user is presented with a message informing him of his error and then is redirected to the login page. If the provided username and password combination is found, the system then redirects the user to the appropriate user interface.

3.3.3.1 Teacher User Interface

The teacher user interface is comprised of very simple forms that allow the teachers to do a number of tasks. These tasks include adding, editing, and deleting assignments and resources, and changing user passwords. Assignments and other

resources related to the course will be stored in different databases depending upon which department the teacher resides. An English teacher, for example, will have his information stored in *English.mdb*.

The main teacher page that is referred to in this section is main.asp. This is where the teacher will select what he wants to do. When the page is first shown, it simply has four choices at the top: 'Choose assignment', 'Upload files', 'Resources', and 'Change Password'. All of the code for these sections is in main.asp. However, each of the sections is invisible to the user until he chooses an option. Once an option is chosen, main.asp makes the appropriate section visible to the user and checks to make sure that each of the other sections is hidden. If another section is already visible, main.asp will hide it from the user before displaying the next section. The details of each section will be discussed below.

3.3.3.1.1 Assignments

If 'Choose assignment' is selected, the teacher will see three drop-down menus; one for adding assignments, another for editing assignments, and the last for deleting assignments. These menus will allow the teacher to select which course he would like to edit and display a button labeled for each function.

When adding a new assignment to the database, the teacher will be directed to enter.asp and must enter the new assignment's name, file, and due date. The teacher has the ability to enter the URL of where the assignment is stored online. If the teacher has already uploaded an assignment file, the file's name can be entered in the text field after 'http://wpi.iccis.net/asp/SHS_Files/'. The teacher will then click on 'Submit', which passes the data to update.asp. Once update.asp loads, the system will add the new

assignment to the correct department's database and alert the user of this fact. When the user clicks 'ok', control will be redirected back to the main teacher page. This process is similar to that used in editing assignments, which is the next topic of discussion.

In the case that the user chooses to edit an assignment that is already stored, the system will load edit.asp. The user must then select an assignment from a drop-down list. The teacher can then change the assignment's file, name, and due date. The assignment's name, file, and description will be taken from the database and the teacher will be allowed to edit these values as he wishes. The due date will also show up on the page, but it will be simply text above the 'New due date' field. The user can change the due date by simply putting the new due date into this field. Once the teacher is done editing the assignment, he clicks the 'Submit' button. The edited values are passed to update.asp where all of the information will be updated in the correct department's database. Once everything has been updated, an alert box containing the status is displayed for the user. The only thing to do here is click on 'ok', which sends the user back to the main teacher page.

The code used to build the editing portion of the system was the most complex due to the fact that data needs to first be pulled from the database, edited, and then stored as a replacement record. The code used to build the sections that add and remove assignments from the database, on the other hand, was much easier to write because each involves only one action on the database. When deleting an assignment from the system, the teacher goes through a very simple process. The system will direct the user to delete.asp. Once delete.asp is loaded, the user must simply choose which assignment he wants to delete from a drop-down menu and click either 'Yes' or 'No'. If the teacher

clicks 'Yes', the chosen assignment is passed to update.asp by record number and the system deletes the assignment with that record number from the database. Once this is done, the system alerts the user that the action is complete. When the teacher clicks on 'ok' in the alert box, the system will send him back to the main teacher page. If the user chooses 'No', however, he will be redirected back to the main teacher page without anything changing in the system.

3.3.3.1.2 Uploading Files

If the teacher selects 'Upload files' at the main teacher page, he is shown lines of text explaining what uploading files will do. When the user clicks on 'Choose files to upload', he will be redirected to upload_file.asp. This page does not receive any values and does not know which user currently wants to upload a file. Therefore, once this process is complete, the teacher is brought back to login.asp, where he must re-authenticate into the system. Upload_file.asp contains very detailed instructions explaining file naming conventions, size limits, and what to do with the files once they are uploaded. By clicking on each of the five different 'Browse' buttons, the teacher will be able to upload up to five files at a time. These files must be less than or equal to 600 KB to be uploaded, or they will be rejected by the server. This limit was programmed into the system to prevent users from uploading extremely large files to the server, which would take up space that may need to be utilized by other users. (A better method of managing server space is to create a disk quota for each user. However, to do this, the system would need a more complex structure utilizing logs that would contain information pertaining to the amount of data used and how much was used by each teacher. The upload section would also have to be designed to keep track of which files

belonged to which teacher. Unfortunately, the complexity of this kind of system made it infeasible to create in the time allotted to build the Web Information System.) Once the user has selected the files he wishes to upload, the teacher can click on 'Upload!' and it will bring him to a page stating how many files have been successfully uploaded and any problems that have occurred. The teacher can then click on 'Return to SHS Web Information System' and he will be redirected back to the login page and will have to enter his user name and password combination again.

3.3.3.1.3 Resources

If the teacher selects 'Resources' at the main teacher page, he will see a drop-down menu allowing him to pick the course he would like to add a resource for. Once the user selects a course and clicks 'Edit', he will be redirected to reso.asp. This page has the same setup as the assignment form. The only difference here is that the three drop-down menus are used to select the assignment to link the resource to, as opposed to the course. From this section, the teacher will be brought to pages just like the ones for add, edit, and delete assignment. From here, the user will go through the same process; only it will deal with resources instead of assignments.

3.3.3.1.4 Change Password

If 'Change Password' is selected, the teacher will see three fields, each labeled descriptively so the teacher knows what to enter into each field. The first field asks for the old password. The other two fields ask for the new password and confirmation of this new password. Since these fields are password fields, the input will appear as asterisks on the computer screen. This is why the system requires confirmation of the new

password; it is important for the teacher to enter the new password exactly the same way each time. Once these fields have been completely filled out, the teacher will click on 'Submit'. This will redirect to changepassword.asp to check and update users.mdb. If the teacher entered the wrong current password or different new passwords, a warning message will be printed and nothing will change in the system. The user will then be redirected back to the main teacher page. If everything is entered properly, users.mdb will be updated and the teacher will now log in with the new password.

3.3.3.2 Student User Interface

The student user interface is the most basic interface of the Web Information System. The purpose of this interface is to display the information entered by the faculty in an easy to read format for students, parents, and other members of the Somers High School community. The information displayed by this user interface is not privileged, and so there is no user authentication required for access. Users simply follow a specific link on the Somers High School website and are redirected to the main page of the student interface, student.asp. This page contains the code responsible for running all of the student interface functions, such as selecting a department, selecting a course, and then displaying the appropriate information. When initially loaded, student.asp simply displays a drop-down box containing a list of all departments available at Somers High School and a submit button labeled "Get Courses." Once a department is chosen and the user clicks the submit button, student.asp submits the department name to itself and reloads. Once reloaded, student.asp checks the department name against the department databases until it finds a match. A new form is displayed for the user. This form

contains a drop-down box listing all of the courses contained in the department database previously selected, a submit button labeled "View Course Information", and a link that will refresh the previous instance of the page in which the user selects a new department. If the user selects one of the courses in the drop-down menu and clicks the submit button, student.asp will submit the course number to itself. After this final reload, student.asp displays all of the information for the specified course in a table format.

At the top of the page is a link to the class homepage, which is specified by the teacher in the case that there is a separate homepage for the class. Under the link is the table containing all of the assignments, due dates, and resources for the specified class. At the bottom is a link to choose another department. Titles in the table are linked if a link was specified in the teacher interface. As stated earlier, the student interface is the most basic of all of the user interfaces. Our intention was to encourage students to use the system by providing a simple and user-friendly interface.

3.3.3.3 System Administrator User Interface

The system administrator's user interface is the basic control panel for the Web Information System. Mr. Mezger is the system administrator for the Web Information System at Somers High School and is the only appointed individual with access to the system administrator's user interface. Originally, the system administrator was supposed to be the school's current network administrator. However, he chose not to be actively involved in the project. Since Mr. Mezger is proficient in using computers and has invested time in learning how the system works, we chose him as the administrator. The system administrator's user interface has options necessary for administering users and

courses. Each of the aforementioned categories contains functions to add, edit, or remove records in one of the tables in the database. Each function in the user interface is presented as a web form with fields that are linked to users.mdb.

When adding a new user to the database, the administrator must enter the new user's first name, last name, username, password, and department. The system administrator must choose the new user's department from a drop-down list of provided department names. This safeguard was put in place to keep consistency in the database fields. If the system administrator accidentally input "english" as the department as opposed to "English", the system, which is case-sensitive, would not access the proper database in the teacher's user interface. The provided drop-down menu prevents this scenario from occurring. Once the system administrator enters the data and submits the form, the system loads the administration options page.

The edit user function works very much like the add user function in that it contains the same fields linked to the same database. However, when the system administrator chooses to edit a user, he is first presented with a drop-down menu listing all of the current users in the database. Once the administrator chooses the user that he wishes to edit from the drop-down menu, a form is displayed that is very similar to the form that adds users. The difference between the two web forms is that the edit user form has all of the selected user's information entered into the fields. The system administrator can then choose to edit only the necessary information rather than to re-enter all of the user's information into the system. This choice of design is effective for two reasons. The first reason is that any fields left unchanged by the system administrator will be stored using the data already present in the system. It will be less

likely that the system administrator will store empty data in the database. Secondly, since the system administrator only has to change the data stored in specific fields, he will not have to worry about incorrectly re-entering data that did not need to be changed in the first place. Once the necessary data is changed and the web form is submitted, the system opens a confirmation window to confirm the user's intent. Once intent is verified, the system changes the necessary data in the database and redirects the user to the system administration options page.

The delete user function is very simple. The system administrator is directed to a web form that contains a drop-down box listing all of the users in the system. He can then select a user to remove from the database. The administrator then submits the web form and a confirmation box is displayed confirming the system administrator's intent. Once intent is verified, the record containing the selected user is removed from the database and the system administrator is redirected to the main system administration options page.

When the system administrator is finished adding records to the *Users* table, he must then assign the user to at least one course in the *Courses* table of users.mdb. The system administrator is therefore given options to add, edit, and remove courses from the *Courses* table. These functions are very similar to those in the user administration section and have the same purpose except that they are applied to the courses rather than to the users.

Adding a course to the *Courses* table in the database is as easy as entering data into web form fields that correspond to the fields in the *Courses* table contained in users.mdb. When entering this data, the desired teacher is chosen from a drop-down list

containing all of the users contained in the *Users* table of users.mdb. The teacher's name is shown on the form, yet it is actually the teacher's ID value that is stored in the *Courses* table in the database. Each course can be assigned to only one teacher. However, multiple instances of a course can be created, each having its own instructor. For example, there may be two Calculus II courses. Therefore, the administrator must set up two separate Calculus II courses in the system. Each instance of Calculus II must have a unique course number for the both of them to exist concurrently. At this point, the administrator can assign a separate teacher to each instance of Calculus II. This addresses the issues of having multiple teachers who teach a version of the same course. Each instance of the course can have a different teacher assigned to it and therefore can hold assignment records that will not be displayed to students taking another version of the same course. Once the system administrator fills in the necessary fields and submits the web form, the information is entered as a record in the *Courses* table of users.mdb and the system administrator is then redirected to the main system administration options page.

The edit course function works like the edit user function in the user administration section of the system administrator's user interface. All of the fields corresponding to fields in the *Courses* table are displayed in a web form with the data already filled in. The system administrator can then change the necessary information or re-assign a teacher or department to the course. This enables the system administrator to quickly modify the system in the case that a teacher leaves the school or changes the courses that he teaches. Any values that are left unchanged in the web form will be left unchanged in the *Courses* table. Once the system administrator has finished modifying

the necessary data and submits the web form, a confirmation box will pop up to verify intent. If intent is verified, the system administrator is then redirected to the main system administration options page.

The remove course function is a simple function that directs the system administrator to a page containing a web form. This web form has a list of all courses contained in the *Courses* table of users.mdb. The system administrator can then choose the course to remove and continue to submit the web form. Upon completion, a confirmation box pops up to verify intent. Once this is confirmed, the course is removed from the *Courses* table. The system then opens the appropriate department database corresponding to the department associated with the course and deletes all of the records that have a course number matching the course being removed. This operation is irreversible. Once completed, the user is redirected to the main system administration options page.

3.4 Faculty Training

Once the Web Information System was fully implemented, the Somers High School faculty members were invited to participate in a training session held at the school. The features of the system were demonstrated and the limitations of the system were also discussed. All faculty members who were present were given their individual user names and passwords during this session and discussed briefly how they might use the Web Information System in their current curriculum. Training documents were also created and distributed to the participants. The documents contain instructions with screen shots showing the reader how to use the Web Information System. These

documents can be found in *Appendix B: Web Information System Training Documents*. The response was overwhelmingly positive and many of the teachers will be using the Web Information System beginning the 2004-2005 school year. We created a brief user's guide, which is available online to all faculty members. Initially, we were under the impression that the use of the system would be voluntary. However, we later discovered that the school is planning to make it policy in the future for the teachers to start using the system.

3.5 Testing the Web Information System

Testing of the Web Information System took place during synthesis and upon completion. Different methods of testing were used during various stages in building the system. This section will outline the methods used to test the system during these stages, the results of the trials, and important discoveries that were made throughout the testing phases.

The initial testing of the Web Information System took place while the system was in its incipient stages. Each page had to be tested while it was being built, as well as after its completion. Initially, this was done by loading the page into two different web browsers, Microsoft Internet Explorer 6.0 and Netscape Communicator 7.1, to make sure that it displayed properly. We quickly discovered that the main user interface pages did not display correctly in both browsers. The issue was that Microsoft and Netscape do not implement support for cascading style sheets (CSS) in a way that allows web pages using this technology to look the same on both browsers. This proved to be a difficult obstacle because cascading style sheets were used to control the visibility of certain elements

within the user interfaces, as well as the positioning of many web elements. Unfortunately, we had to compromise some of the positioning parameters in order for the pages to have an acceptable look in each browser. The visibility control issue was fixed by writing Javascript code that determines the manufacturer and version of the web browser being used, and then uses the document object model (DOM) of that browser. Thus, if a user is viewing a user interface in Netscape Communicator, the code within the system will use the DOM that is compatible with Netscape. Conversely, viewing the interface using Microsoft Internet Explorer will trigger the system to use the DOM compatible with Microsoft's implementation of CSS.

Another aspect of the Web Information System that was tested during synthesis is the functionality of the ASP code used to do the 'behind the scenes' work. Each Active Server Page was tested in a web browser using temporary print statements to ensure that the proper form fields were being processed and sent to the next page. Each page was also tested using the same method to ensure that it was receiving required values from the previous page. This testing was necessary in order to verify that end users would not get unexpected results while using the system, and to verify that user credentials were being passed between pages when necessary. While testing the ASP scripts, we found that the Web Information System would crash on two conditions. The first condition is that the database from which the system is trying to pull data has no records matching the criteria given by the script. This was fixed by writing code to check for the presence of records matching given criteria. In the case that the appropriate records do not exist, the system gives the user an error message stating that there are no records to display, and then gives the user an option to return to the previous page. The second condition under which the

system was crashing was when form fields with null values were submitted into a database. This issue was circumvented by writing Javascript code to validate form fields before submission. If a field is left blank, a default value is assigned to it and then stored in the database. The pages that access records from the database contain scripts that check for these default values. Default values are not displayed for the end user during retrieval. Internet Explorer 6 was used to test the ASP scripts. However, since ASP is compiled and executed on the server before information is sent to the end user, the scripts are independent of browser limitations. Therefore, all of the ASP scripts produce the same results on all web browsers.

Once the Web Information System was complete it was tested in two phases. The first phase was to verify that the system worked for any user trying to perform any of the available functions. We did not recruit other individuals to test the system. Instead, we tested the system as though we were end users, first as system administrators, then as teachers, and finally, as students. We performed numerous trials in which we utilized every feature of the Web Information System. In doing this, we were able to fix errors that were present without having to present what would have been an unfinished system to Somers High School.

After the first testing phase was completed, we recruited Mr. Mezger as a beta tester for the Web Information System. Throughout this phase, Mr. Mezger set up users using the system administrator's interface. He also used the teacher interface to enter data for his own classes and continued to use the system for a period of three weeks. Mr. Mezger did not discover any errors in the system during this testing phase. However, he

did offer suggestions for future improvements to make the system more user-friendly.

These improvements are discussed further in the future work section of this document.

3.6 Post-Implementation Analysis Methods

The methods used to analyze the benefits of the Web Information System are

discussed in this section. As stated in the preface, we did not collect quantitative data to

make this analysis. The faculty and students at Somers High School would not have used

the system enough in the time allotted for us to collect useable quantitative data.

Therefore, we collected qualitative data provided by the Somers High School faculty and

students to analyze the perceived benefits of using the Web Information System. This

data was collected in the form of surveys, focus groups, and a brief written evaluation by

Mr. Mezger. We created surveys and administered them before building the Web

Information System and then administered a second set of surveys after the system was

implemented. The surveys are contained in *Appendix A: Pre-Implementation and Post-*

Implementation Surveys. The first set of surveys (pre-surveys) was created so that we

could ascertain the common beliefs of students and faculty regarding the benefits of using

computer technology as a teaching tool. As was mentioned before, the second set of

surveys (post-surveys) was only targeted at students and teachers, since the school

administrators currently do not have access to or a use for the Web Information System.

The student surveys were administered to two of Mr. Mezger's classes. One class was a

Freshman class and the other a Junior class. The teacher surveys were administered on a

volunteer basis. Surveys were left in the teachers' mailboxes and then collected one

week later. The survey results are discussed later in this section.

As mentioned above, the other method used to collect qualitative data was the use of focus groups. Initially, we only planned to hold one focus group meeting in which a group of teachers would meet with us and discuss their thoughts regarding the system. However, the training session that was held after the system was installed also turned into a focus group, which was to our benefit. This group consisted of the heads of the departments at Somers High School. There were six members in the group as well as two other members that were present for only a short time. These teachers were able to discuss their thoughts about the system while they were in the process of learning how to use it. The second focus group meeting that we held consisted of only two members, Mr. Mezger and Mr. Stone. Mr. Stone had not attended the first focus group meeting and so we were able to collect additional input from him. Mr. Mezger had served as more of a training aid during the first meeting, so he was able to supply more valuable input during the second meeting. The results of our analysis methods are discussed below.

After analyzing the pre-surveys, we saw that the students seemed split down the middle as to when they would use the system. Fourteen responded that they would use it only when required to by the teacher, another fourteen responded that they would use it even if not required, and one student would never use the system. All but two of the students believed that having resources online for each class was a good idea, while three students saw the internet as a non-valuable resource. Somewhat unexpectedly, six students responded that they had their own webpage at the time of the pre-survey. Most students spent the majority of their time on the internet socializing with friends, which was anticipated. Only one of the students did not have internet access at home and used the school for most of his internet usage.

The results for the student surveys weren't very surprising when looking at the raw data, but when using a technique known as data mining we found more interesting associations than originally expected. For analysis on the student surveys, we employed the use of Weka, a data mining tool. This allowed us to view associations quickly that would otherwise have taken much more time to uncover. Through this tool, we found quite a few interesting associations and rules that will be highlighted here.

The student pre-surveys yielded many associations between school grade and answers to other questions. According to our data mining, if most of the student's time on the internet is spent gaming and he has advanced computer expertise, he is a freshman. On the other hand, if most of the student's time on the internet is spent gaming and he has proficient computer expertise, he is a junior. If the student never uses the internet as a resource for learning, then he is most likely a freshman. There were many other associations such as this that can determine which grade a student is in by the answers he had for some of the other questions.

There were also other associations apparent from the surveys. A student who has taken two computer classes and has advanced computer expertise is more likely to use the system than someone with fewer classes or expertise. Students who have either a small or large amount of computer classes and/or expertise view the internet as a valuable resource for learning. Those in the middle range, however, don't find the internet to be such a valuable resource for learning.

Fourteen of the thirty three students who completed the survey felt that the website was a student-centered resource, rather than a resource geared more towards parents and community. Only twelve of the students said that they would use the system

if not required to use it, but no students responded that they would not use the system at all. This batch of respondents consisted mostly of freshmen, which made up thirty of the students from whom we received surveys. Twenty students thought that the system was helpful for doing homework assignments, which is a pretty good percentage considering the short time span that the students had to use the system. Those students believed the system was helpful mostly because it allowed those that weren't in school or forgot to record the homework assignment a chance to do the homework and have it ready for the due date.

The student post-surveys gave some of the same types of associations. There were some major differences between grade levels again in the post surveys. Every student who thought that the information system would not help on homework assignments was a freshman. Only some of the students surveyed had a chance to use the system in Mr. Mezger's classes, so the others based their responses on what they perceived would happen in the future. The only students who responded that they would solely use the system when required to by the teacher were freshmen. Students who spend most of their time on the internet checking email are juniors. If a student considers himself exceptional and spends most of his time on the internet doing school-related work, he is also a junior. This shows some of the differences in maturity levels between the average freshman, who is more likely to spend time socializing, and the average junior, who is more likely to use the system.

All juniors decided that they would use the system even if it wasn't required, while the majority of freshman responded that use of the system would have to be required by the teacher in order for them to use it. Students who spent most of their time

on the internet doing school-related work would use the system without being required to by the teacher, as well as the students who classified themselves as exceptional. If the student's teacher put one or zero assignments online during our beginning phase, the student was more likely to think that the system didn't help with homework. The inverse of this was also true and expectedly so.

All of the teachers had internet access at home and had seen the Somers High School website at the time that the pre-surveys were distributed. Only two of the sixteen teachers didn't use computer technology at all to supplement their teaching. None of the teachers who were surveyed saw the website as being geared towards the students, but rather that parents and community got the most use out of the website than anyone else. Five of the teachers didn't see that having the ability to add assignments and resources would be valuable to students or teachers. Thirteen teachers thought that students would visit the website more often if a web information system was in place.

We also used Weka to mine patterns within the teacher data. It wasn't as helpful as it was with the student data since there were almost twice as many student survey respondents, but we were still able to detect some helpful associations. The teachers left more questions un-answered in the surveys than did the students.

Those teachers who, in the pre-survey, thought that adding assignments and resources for the students to look up online was a bad idea also believed that student traffic to the Somers High School website would not change. Surprisingly, one of these teachers often uses computer technology to supplement his teaching. Obviously, those teachers who thought posting assignments and resources online is a good thing for the students also believed that student traffic to the website would increase in the near future.

Teachers who don't use computer technology to supplement their teaching whatsoever thought that adding resources would be valuable for the teachers.

We received fewer surveys from the teachers once the system was implemented, but we still had eleven post-surveys returned to us. All of the teachers now used computer technology to supplement their teaching in some way. The teachers still held firm that the website was designed more for parents and community than for anyone else, but this could be for a number of reasons. One reason being that some of the teachers believed that parents would use the system to find out what their children had for homework instead of the students getting assignments and resources from online. Only two teachers didn't think that student traffic to the website had changed after implementation or would change in the near future.

During analysis of the post surveys, we noticed that all of the teachers who thought reluctant teachers would be more likely to use a system like this now also think that student traffic to the Somers High School website will also increase. We confirmed that these were the same teachers who said the opposite during the pre-surveys. Some of the rules here got quite complex, using ten of the other questions in order to determine whether or not a teacher would think that adding assignment and resources online would be helpful to the students.

We ended up only distributing separate pre-surveys for the administrators and faculty. For post-surveys, we simply gave the administrator a teacher survey to fill out. We never implemented any website update functionality for the administration as we had originally planned. If we were able to add this feature, the system would not be any more

effective for students. We only received seven pre-surveys from the faculty and were unable to data mine them. Therefore only the raw data analysis will be presented.

All of the administrators and faculty felt that the internet is a valuable resource for learning. They also all agreed that reluctant teachers would be more likely to use the technology with a system like ours, adding assignments and resources would be valuable to both students and teachers, and student traffic to the website would increase once the system has been implemented. Most believed that before implementation parents and community got the most use of the website and, thus, visited it more often. Most administrators also used computer technology of some kind as part of their job, and four out of the seven post information on the website often.

The data analysis shows that the majority of those surveyed believe that the Web Information System is beneficial to students. Some of the survey results were expected. For instance, students responding that they would only use the Web Information System if required did not surprise us. As confirmed by Mr. Mezger and Mr. Stone, students at the high school level are generally not interested in the general subject matter being presented to them and so it is no surprise that they would not be overly enthusiastic about using a system that pertains to homework. However, these same students also responded that they believe that they system would be helpful, which shows that even though they may not want to have anything more to do with their schoolwork, they do recognize that it is beneficial to have such a system in place. Many of the teacher surveys produced unexpected results. Initially, we had expected that most of the teachers would be less technologically adept and more reluctant to use computer technology as part of their pedagogy. However, we discovered that not only did most of the teachers surveyed have

internet access and experience using computers, but most of them already used computer technology in their classes. Overall, analysis of the survey data shows that the majority of respondents believe that the Web Information System is beneficial to Somers High School and is a useful, non-intrusive supplement to their curriculum.

The focus group meetings at Somers High School provided valuable data and confirmed our conclusions regarding the survey data. As stated in the beginning of this section, the first focus group meeting took place during the training session held at the school upon completion of the system. As the participants learned to use the system, they commented on how the system would be a help to the users. They also commented on which features were most beneficial to teachers and ways that we could improve the system. Many of the participants believed that the system was beneficial because of its ability to display outside resources. These teachers all wished to give students access to materials outside the classroom but did not know of an easy way to accomplish this. The Web Information System provides a simple uniform interface for the teachers to use so that they can upload and link files from their own computers or simply link to internet resources and make this information universally available to students. The participants were very happy with this feature. They were also happy with the ease of use of the system. The system was not intended to add extra work for teachers and students but rather to make certain processes easier. This was accomplished for the most part. However, we did notice that there was slight confusion amongst the teachers when trying to use certain aspects of the system. The teachers, who are generally unfamiliar with computer file systems, were a bit confused when presented with the path to their uploaded files. Issues such as that will be addressed in future work done to the system.

The second focus group meeting consisted of Mr. Mezger and Mr. Stone. We met with them for two hours to go through the system, discuss its features, and discuss their thoughts on its effects on teaching. Their ideas regarding features of the system are discussed in the future work and recommendations section of this document. The discussion is also available for reference on the accompanying CD, titled *Focus Group Meeting*. Mr. Mezger told us that he believes the system would be beneficial because it would be a way for the parents to get involved in what their children are doing. He thinks that if parents have a way of knowing what their children are doing in school, they will be more likely to get involved and that will lead to greater student progress. This apparently is a common belief within the school system. It is so strong a belief that the school has decided to make it policy for the teachers to make information available online in the coming years. Mr. Mezger thinks that the Web Information System is the best way of accomplishing this because teachers can use it without having to learn how to program. Mr. Stone was much more skeptical about the system. He, like Mr. Mezger, thinks that it is important that parents get involved in their children's schooling, and that the system is a very good way of facilitating this. However, Mr. Stone strongly believes that there is no way that students would be more interested in what is on the Somers High School website based on using the Web Information System because they just don't have much interest in school in general. He suggested that the system would be of much more benefit to the teachers and the community because it cuts down on teacher workload and lets the community see what is going on in the high school. However, he did suggest ways in which the system would be more useful to students. These ideas are discussed in the future work and recommendations section of this document. As stated previously,

Mr. Mezger also furnished a brief written evaluation of the Web Information System. The evaluation basically reiterates the points made in this section and contains his thoughts regarding the structure and functionality of the system. This document is located in *Appendix C: Written Evaluation of the Web Information System by Carlos Mezger*.

In conclusion, our analysis methods show that out of all of the participants given a chance to critique the system, most believe that the system does have considerable benefit to teachers, students, and community. There was some reluctance displayed by some of the participants, but this was to be expected because technologies such as this are not exactly commonplace within most school systems. Most of the people who were skeptical had not yet been exposed to system. Some had changed their minds after the system was completed. The overall outlook of the participants in our study was positive and our study shows that there is a strong feeling that the implementation of a Web Information System will produce noticeable benefits to the high school community.

3.7 Societal Aspects

We originally wanted to hear back from students, teachers, faculty, and the general public in Somers. Although the thoughts of all constituents would have been valuable to our analysis, we mainly focused on the feedback from teachers to obtain the results of this study. This is because, if the teachers don't want to use the system, then the students will never get a chance to make use of it either. Mr. Mezger's detailed input helped us to determine the veracity of the proposed benefits of the system. This project has resulted in many of the teachers reviewing their teaching methods and modifying

them to include the system. The Somers High School administration has also recommended that the teachers incorporate the Web Information System into their pedagogy since they will be creating a policy mandating its use in the future.

As stated earlier, we conducted an extensive interview with Mr. Mezger and one of his associates, Mr. Stone, after we implemented the Web Information System. During the interview, they discussed with us the benefits of using the Web Information System, as well as some recommendations for improvement and new features. We will not be modifying the system to include these recommended features during the timeframe of this project, but their suggestions could be used as the starting point for a future project. The results of this interview are discussed in the future recommendations section of this document.

With these forms of feedback, we were able to more accurately determine what features should be added to or removed from the system. This has given us enough information to add new functionality to the system and alter it so that it is tailored to the needs of the school. Judging by the positive response of the general faculty and the specific perceptions of Mr. Mezger and Mr. Stone, the Web Information System is a valuable addition to the school's curriculum and will allow students and teachers to do their tasks with greater efficiency.

3.8 Shortcomings of the Web Information System

The Web Information System at the time of this writing did not completely satisfy all of our expectations. Some of the shortcomings were due to the limited time we had to build the system and scheduling conflicts with Somers High School. In the incipient stage

of this project, we had anticipated having twelve weeks to build the Web Information

System. However, as the planning of the project and the project proposal were nearing

completion, we soon realized that we would only have five weeks in total to build the

project and collect meaningful data for analysis. The lack of available time has limited

the number of features we were able to implement reliably. Somers High School's

scheduling also created hindrance to our progress on a few occasions. As an example,

the system was ready in February. Unfortunately, the week that we had planned to unveil

the system happened to be the same week that Somers High School was on vacation.

Also, the system administrator of Somers High School's computer network was never

present at any of our meetings with the staff. Understandably, most of these issues were

the result of conflicting schedules as the teachers and administrators make their jobs the

primary focus. Unfortunately, because of this, the integration of the Web Information

System into the Somers High School website was not as seamless as we had originally

hoped it would be. Meeting with the school faculty to introduce the completed system

was also delayed due to scheduling conflicts. The features that were not implemented in

the final project will be discussed in greater detail below.

Due to the time constraints and budget limitations at Somers High School, it was

not possible to implement an online testing system in the Web Information System. The

lack of adequate time to test this feature would have led to an unreliable testing system

that might facilitate student cheating. This is obviously not in the best interests of the

school or the students and would undermine the purpose of the project. Also, we found

that Somers High School would have to find and purchase a server-based program to

email test results from the server to the teacher. Although this may have been possible, it

would not have been feasible to have this part of the system running within the timeframe of the project. As an alternative method, we had considered storing test results in a separate database that could be later accessed by the teacher. This system would also have the ability to auto-correct multiple choice tests and send grades to the teacher. However, after some consideration, we decided that this alternative would either begin to take up too much space on the server or it would require constant maintenance to keep from growing too large, both being undesirable outcomes. Ultimately, we decided to forego incorporating this feature as part of this project.

4. Recommendations for Future Work and Improvements

In this section, we outline ideas for future work, based on the suggestions of two faculty members from Somers High School, Mr. Mezger and Mr. Stone.

Mr. Stone suggested that we have more descriptions inside the system itself in order to make the operation of the system more self-explanatory. In addition, he suggested the use of help sections for each of the teachers' entries. This could be in the form of mouse-hover help (such as that provided by Windows) or could be a separate window that shows help for whatever the user clicks. Depending on size limitations, it was suggested that we could put screenshots into the help section so that teachers could see what is supposed to go into each field and its purpose. We would like to make the names and descriptions better in the near future so that the system is easier to use.

An additional idea brought up by Mr. Stone was that we shouldn't have the path to the location of the uploaded files show up automatically in the field for assignment files. Instead, we could have check boxes that allow the user to add a file if they wish, or not add a file and simply use the description field for the assignment. If the teacher were to type in the name of the file it would automatically go to the path for uploads in our system. If the teacher were to type in a full URL, such as "http://www.wpi.edu/some_file", that assignment would link to some_file at http://www.wpi.edu. This would make the path to where files are uploaded transparent to teachers, so they would never have to worry about it.

Both Mr. Mezger and Mr. Stone suggested that we make some aesthetic changes so that the interface looks more attractive to the user. They suggested the addition of color, maybe a frameset, and different fonts to add a bit of zing to the interface. The

Somers High School website does not have a frameset, so we couldn't simply put our system into it. That would have been preferable, since it would keep the system portable and allow other schools to use the system with their own framesets.

We took a look at school-notes.com, a system that had been previously used by Mr. Mezger to give us some ideas of how to improve our system. This site gave us a few ideas about how to make our system more descriptive and how to set up our forms a little better so that they are easier to understand.

Another suggestion made by Mr. Mezger and Mr. Stone was to have a feature for teachers to edit their list of assignments from a word document. However, it was decided that this feature would introduce too many problems. One of the problems is uniformity; one of the advantages of our system is that it makes uniform pages that are basically the same for every class. Allowing teachers to edit their assignments from a word document would make it harder for teachers since they would have to update the document for every class. It could also cause problems for students since each class would have a different format for the assignments. Another reason this idea was rejected was because we want to keep the forms simple enough to encourage teachers with minimal computer experience to use the system. We don't want to make the system seem like extra work for the teachers since we want them to use it so that it can help in their classes. This proposal would also mean that teachers would have to have the correct applications to edit the word document and students would have to have the correct applications in order to view the web pages. Along these lines, formatting could also cause issues with consistency. Because of these inherent problems, we recommend that this suggestion not be implemented.

A lot of colleges, like WPI, have discussion boards for classes so that students can get extra help remotely when not in class. This is a great idea for colleges since there is much work for students to do outside school, but it turns out to be not as good a prospect for high schools. Teachers don't want to have to check discussion boards and reply to students all hours of the day seven days a week and, at the high school level, students wouldn't be likely to ask many relevant questions that would require teacher responses. Even if the discussion board was left solely for the students to discuss issues amongst themselves, the teacher would still have to monitor the boards for appropriate use. This is simply too much maintenance for most teachers, so it was something that Mr. Mezger and Mr. Stone didn't think would be a good addition to the system. Discussion boards are a possibility for future work, but they are of low priority since very few teachers would be making use of them.

Mr. Stone didn't like how the resources were set up for viewing on the student page. He suggested that we simply have a link at the top of the assignment page that links to a page that has resources that are general for the course. For the resources that are linked to assignments, we would just add another column into the assignment list that would give the names of the resources and have the proper links off of each one. This would make it easier for students to view those resources that are specific to an assignment.

Instead of using a list to show the assignments for each class, Mr. Stone proposed that we use a calendar. One way to implement this suggestion would be to put the name of the assignment within the correct date, and allow the user to click the assignment name to view additional information. Another way would be to have the date clickable and

have it lead to another page with all of the assignments for that date. This would make it very easy for students to view what is due on Thursday, let's say, instead of having to know the due date so they can check for the correct assignment in the list. This would also allow the system to be more versatile in terms of formatting since only the assignment for one day would be shown on each page, and thus the information wouldn't have to be as condensed as it is now.

The idea that generated the most discussion was that of including a feature that allows the teacher to activate and deactivate assignments. This would allow the teacher to add all of the assignments one year and then deactivate them for the following year. When deactivated, students wouldn't be able to view those assignments. When the teacher is ready to give the class a certain assignment, he could simply activate that assignment again so that it shows up for the students to see. With this addition, teachers would be able to store all of their assignments in the database and would only have to edit dates to correspond with the schedule, instead of having to re-enter the assignment or have it be viewable all year long. There was much discussion on this topic, but the system of activating and deactivating seemed to be the best way of handling the issue. For this to be simple for the teachers, we would make a list that has all of the assignments in it viewable by the teacher and gives the status of the assignments (whether they are active or not). The activation portion of the system is the highest priority for future work, but will likely take the most time.

Along with this activation idea, would be a feature that allows the teacher to select those assignments to be deleted at the end of the year. At the end of each school year, the administrator would go through the system and delete those assignments that

teachers have selected for deletion. We weren't very sure about allowing teachers to keep assignments in the databases from year to year at first, but Mr. Stone and Mr. Mezger told us that scalability wouldn't be an issue in their school. They don't foresee any problems with the databases getting too large or too slow, so allowing teachers to select what gets deleted instead of being non-discriminate and deleting everything would be a good feature to have. Our recommendation is that this feature not be one of the higher-priority modifications to the system since teachers can already delete assignments, though each one has to be deleted separately. It would be necessary to first implement the activation feature before the deletion element could be incorporated into it.

One thing that we were thinking about from the start was allowing teachers to browse files that they had uploaded so they could select which file they wanted to link to each assignment. As of now, that is impossible because the server we are running the system on doesn't allow us to set separate permissions for each teacher. If we could set the permissions individually, we could make a directory for every teacher, allowing them to view, edit, and delete their files while not being able to see other teachers' files. This would be easier than writing down the name in the assignment file field. This would be a great feature to add for future work, but is dependent on the limitations of the school's server.

Additional issues that were brought up had to deal with the way assignments were listed in the teacher section. Teachers should be able to view the URL for each assignment's file from the list, so that it can be used for other assignments and can be easily referenced. It was also suggested that teachers have a way to order the list other

than by due date. There could be different sections of the course that the teacher would like to see all together, or he could use some naming system for convenience.

5. Conclusions

Use of computer technology to supplement teaching methods can be beneficial if the technology is used properly. Technology's usefulness is diminished if it is intrusive or difficult to learn. The results of this study show that having a system such as the Web Information System provides educational benefits to students, while at the same time promoting sound pedagogical practices.

In order for computer technology to be an effective classroom tool, it must be easy to use. Our system meets this criterion. Teacher responses to the survey questions administered before and after implementation of the Web Information System indicate a change of opinion among several faculty members. Those teachers who initially seemed reluctant to use technology came to believe, after trying the Web Information System, that students and teachers would be willing to use such a system. These opinions were seconded during focus group meetings with faculty who had used the Web Information System. From the student surveys distributed after implementation, we discovered that over three quarters of the students found the Web Information System easy to use, with one quarter of the students proclaiming that it was very easy to use.

One of the educational benefits of incorporating the Web Information System into the curriculum is the way it presents material to students in an organized fashion. Teachers control the content in the system, so that only relevant material is displayed. This material is easy for the students to retrieve and, because of the way it is organized, students with poor organizational skills are no longer at a disadvantage. The participants of the first focus group meeting stressed the importance of this benefit and were impressed with how the Web Information System addressed it.

Another way the Web Information System enhanced student learning was by increasing student traffic to the Somers High School website. Before the system was implemented, some of the teachers thought that the addition of the system would have no effect on the students' interest in visiting the school's website. However, once the system was in place, these same teachers changed their minds. Information garnered from the surveys indicated that the teachers now agreed that putting an easy-to-use system in place would increase student traffic to the website, which in turn would make the students more likely to check out other resources online.

Some of the more surprising conclusions came from the student data. As expected, we found that most of the students surveyed had exposure to computers and the internet. Originally, we thought that this would make most students eager to use a system that would be simple and would have educational benefits to them. However, after using Weka to mine data from the surveys, we found a correlation between the age level of the students and their willingness to use the Web Information System. Of the students who responded, all of them believed that the system would be beneficial, but younger students mostly responded that they would only use such a system if required to do so. However, older students responded that they were more likely to use this system even if it wasn't required. This suggests that student maturity has an effect on the willingness to explore unconventional methods of learning. Perhaps younger students are more indifferent to the ways that material is presented to them and the Web Information System is not stimulating enough to pique their interest. Mr. Stone suggested that students at the high school level aren't especially interested in the subject matter presented in their courses and therefore would not be receptive to anything that would extend their exposure to

more material. This has been shown to be true mainly for the younger students. However, it is not necessarily true for the older students. This could be for a number of reasons. Older students have a more extensive background in their general studies and therefore have a greater understanding of what they are being taught. Younger students may find concepts difficult to master and therefore do not want to deal with the subject matter any more than they have to in order to meet basic requirements. Older students also begin thinking about college and their future, and therefore are more likely to want to succeed academically. This alone may be motivation for them to use the resources contained in the Web Information System. Another study would be necessary to definitively uncover the factors that correlate student maturity with willingness to learn.

Based on our research of studies conducted at other schools, our analysis of the Web Information System, and the opinions of students and professionals in the teaching field, it has been demonstrated that proper use of technology as a tool for teaching can be an effective way of educating students. The Web Information System is a simple, non-intrusive way to introduce computer technology into pedagogy. The benefits of having this system have already been apparent at Somers High School and will continue to grow as teachers and students continue to use the system.

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Appendix A:
Pre-Implementation
and
Post-Implementation Surveys

Student Survey for WPI Interactive Qualifying Project 2004

Please take a few moments to fill out the following survey. It is being administered by Jeff Popham and Evan Desmarais as part of their Interactive Qualifying Project at Worcester Polytechnic Institute. This survey is the first of two surveys. The second survey will be administered sometime in mid-April. Each survey should take no longer than five or ten minutes of your time. All of your responses will be kept completely confidential and will only be viewed by those administering the survey. However, we do ask that you please write the last four digits of your phone number in the top right corner of this page. This will allow us to compare the responses of the first survey with those of the second survey without asking names. We appreciate you taking the time to fill out this survey. Thank you.

Questions 1-5 pertain to your general use and knowledge of computer technology:

1. How would you rate your familiarity and expertise with computers?
    a) I have little or no familiarity or expertise.
    b) I can do basic tasks, such as checking email or using the internet, with little or no help.
    c) I can do more advanced tasks, such as installing my own software or troubleshooting small problems, with little or no help.
    d) I am very proficient in doing advanced tasks with a computer.

2. On average, how many hours a week do you use the internet?
    a) I do not use the internet
    b) 1-3 hours
    c) 4-6 hours
    d) 7 hours or more

3. How often do you use the internet as a resource for school assignments or projects?
    a) Frequently
    b) Sometimes, if it is absolutely necessary
    c) Never

4. Do you have internet access at home?
    a) Yes
    b) No

5. What do you spend most of your time doing on the internet?
     a) Checking email
     b) School-related use
     c) Gaming
     d) Socializing (i.e. Instant Messaging, Chatting, etc.)
     e) Other recreational use
     f) I don't use the internet

6. Do you have your own website?
     a) Yes
     b) No

Questions 7-15 pertain to your perceived value of the internet as a learning resource and your opinion of the current state of the Somers High School website.

7. Do you view the internet as a valuable resource for learning?
     a) Yes
     b) No

8. Have you seen the Somers High School website?
     a) Yes
     b) No

9. How often do you visit the Somers High School website?
     a) Never
     b) Occasionally to find certain information that I know is online.
     c) Occasionally to see if anything is being done to the site.
     d) Frequently

10. Who do you think currently gets the most benefit from visiting the Somers High School website?
     a) Students
     b) Teachers & Staff
     c) Parents & Community
     d) Nobody

11. Do you think that having the ability to view extra resources and course assignments on the web would be a useful feature for students?
- a) Yes
- b) No. Students are not likely to make use of this feature

12. Do you think that students would be likely to use a web-based system in which they would have access to educational materials?
- a) Yes
- b) Only if it was required
- c) No

13. What year in high school are you?
- a) Freshman
- b) Sophomore
- c) Junior
- d) Senior

14. How would you rate yourself as a student?
- a) I am an exceptional student
- b) I am above average
- c) I am an average student
- d) I am a below average student

15. How many courses have you taken that are relevant to computer training? (This includes typing, technical training, etc.)
- a) None
- b) One
- c) Two
- d) Three or more

16. Where do you most frequently use a computer?
- a) I don't use computers at all
- b) School/School Library
- c) Home
- d) Work
- e) Other: _____ *(Please Specify)*

Thank you for completing this survey. Please return it to the individual administering the survey.

Student Survey for WPI Interactive Qualifying Project 2004

Please take a few moments to fill out the following survey. It is being administered by Jeff Popham and Evan Desmarais as part of their Interactive Qualifying Project at Worcester Polytechnic Institute. This survey is the second of two surveys and should take no longer than five or ten minutes of your time. All of your responses will be kept completely confidential and will only be viewed by those administering the survey. However, we do ask that you please write the last four digits of your phone number in the top right corner of this page. This will allow us to compare the responses of the first survey with those of the second survey without asking names. We appreciate you taking the time to fill out this survey. Thank you.

Questions 1-5 pertain to your general use and knowledge of computer technology:

1. How would you rate your familiarity and expertise with computers?
     e) I have little or no familiarity or expertise.
     f) I can do basic tasks, such as checking email or using the internet, with little or no help.
     g) I can do more advanced tasks, such as installing my own software or troubleshooting small problems, with little or no help.
     h) I am very proficient in doing advanced tasks with a computer.

2. On average, how many hours a week do you use the internet?
     e) I do not use the internet
     f) 1-3 hours
     g) 4-6 hours
     h) 7 hours or more

3. How often do you use the internet as a resource for school assignments or projects?
     a) Frequently
     b) Sometimes, if it is absolutely necessary
     c) Never

4. Do you have internet access at home?
     a) Yes
     b) No

5. What do you spend most of your time doing on the internet?
   a) Checking email
   b) School-related use
   c) Gaming
   d) Socializing (i.e. Instant Messaging, Chatting, etc.)
   e) Other recreational use
   f) I don't use the internet

6. Do you have your own website?
   a) Yes
   b) No

Questions 7-15 pertain to your perceived value of the internet as a learning resource and your opinion of the current state of the Somers High School website.

7. Do you view the internet as a valuable resource for learning?
   c) Yes
   d) No

8. Have you seen the Somers High School website?
   c) Yes
   d) No

9. How often do you visit the Somers High School website?
   e) Never
   f) Occasionally to find certain information that I know is online.
   g) Occasionally to see if anything is being done to the site.
   h) Frequently

10. Who do you think currently gets the most benefit from visiting the Somers High School website?
   e) Students
   f) Teachers & Staff
   g) Parents & Community
   h) Nobody

11. Do you think that having the ability to view extra resources and course assignments on the web is a useful feature for students?
    c) Yes
    d) No. Students are not likely to make use of this feature

12. Do you think that students use the web-based system where they have access to educational materials?
    a) Yes
    b) Only if it was required
    c) No

13. What year in high school are you?
    a) Freshman
    b) Sophomore
    c) Junior
    d) Senior

14. How would you rate yourself as a student?
    a) I am an exceptional student
    b) I am above average
    c) I am an average student
    d) I am a below average student

15. How many courses have you taken that are relevant to computer training? (This includes typing, technical training, etc.)
    a) None
    b) One
    c) Two
    d) Three or more

16. Where do you most frequently use a computer?
    a) I don't use computers at all
    b) School/School Library
    c) Home
    d) Work
    e) Other: _____ *(Please Specify)*

17. Do any of your courses use the web information system for homework assignments and resources?
      a) Yes
      b) No

18. If you answered "Yes" to the previous question, how often do teachers who use the system generally put a homework assignment online?
      a) Every assignment
      b) Most assignments
      c) Some assignments
      d) Only used it once

19. Do you find this system helpful for doing homework assignments?
      a) Yes (please list how) _____

                                        _____
                                        _____

      b) No

20. How easy is the web information system to use?
      a) Very easy
      b) Pretty easy
      c) Average
      d) Difficult
      e) Very difficult

21. What else would you like added to the system?
      a) Nothing, I like it how it is
      b) I would like to see more features, such as

                    _____
                    _____
                    _____

Thank you for completing this survey. Please return it to the individual administering the survey.

Teacher Survey for WPI Interactive Qualifying Project 2004

Please take a few moments to fill out the following survey. It is being administered by Jeff Popham and Evan Desmarais as part of their Interactive Qualifying Project at Worcester Polytechnic Institute. This survey is the first of two surveys. The second survey will be administered sometime in mid-April. Each survey should take no longer than five or ten minutes of your time. All of your responses will be kept completely confidential and will only be viewed by those administering the survey. However, we do ask that you please write the last four digits of your phone number in the top right corner of this page. This will allow us to compare the responses of the first survey with those of the second survey without asking names. We appreciate you taking the time to fill out this survey. Thank you.

Questions 1-5 pertain to your general use and knowledge of computer technology:

1. How would you rate your familiarity and expertise with computers?
- i) I have little or no familiarity or expertise.
- j) I can do basic tasks, such as checking email or using the internet, with little or no help.
- k) I can do more advanced tasks, such as installing my own software or troubleshooting small problems, with little or no help.
- l) I am very proficient in doing advanced tasks with a computer.

2. How often do you use computer technology to supplement your teaching methods?
- a) I do not use computers to supplement my teaching at all
- b) I encourage students to use computers, but my curricula does not require it
- c) I occasionally assign projects that either require the use of a computer or are accomplished with much greater ease if the student uses a computer
- d) I frequently assign projects that require the use of a computer as a resource

3. Do you have internet access at home?
- a) Yes
- b) No

4. On average, how many hours a week do you use the internet?
- i) I do not use the internet
- j) 1-3 hours
- k) 4-6 hours
- l) 7 hours or more

5. Do you have your own website?
- a) Yes, I have a school-related website.
- b) Yes, I have a website that is not school-related.
- c) Yes, I have at least one website that is school-related and one that is not.
- d) No, I do not have a website.

Questions 6-15 pertain to your perceived value of the internet as a learning resource and your opinion of the current state of the Somers High School website.

6. Do you view the internet as a valuable resource for learning?
- e) Yes
- f) No

7. Have you seen the Somers High School website?
- e) Yes
- f) No

8. How often do you visit the Somers High School website?
- i) Never
- j) Occasionally to find certain information that I know is online.
- k) Occasionally to see if anything is being done to the site.
- l) Frequently

9. Who do you think currently gets the most benefit from visiting the Somers High School website?
- i) Students
- j) Teachers & Faculty
- k) Parents & Community
- l) Nobody

10. Do you think teachers who are reluctant to use computers to supplement their curricula would be more inclined to embrace computer technology in their teaching methods if the technology was less complicated?

      a) Yes

      b) No

11. Do you think that having the ability to add resources and course assignments on the web as part of the Somers High School website would be useful to teachers?

      a) Yes

      b) No

12. Do you think that having the ability to view extra resources and course assignments on the web would be a useful feature for students?

      e) Yes

      f) No. Students are not likely to make use of this feature

13. Do you currently use the web to post assignments or to post helpful information for your students?

      a) Yes

      b) No

14. How do you think adding the ability for teachers to add and update resources and assignments on the Somers High School website will affect student traffic to the website?

      a) Students will visit the Somers High School website more often.

      b) Nothing will change, or there will be an insignificant change.

      c) Students will be less likely to visit the Somers High School website.

15. Do you think that having resources available online from other teachers who teach the same course as you will benefit students?

      a) Yes

      b) No, students are not likely to even bother using these resources.

Please put this survey in Mr. Mezger's mailbox once you have completed it. Thank you for completing this survey.

Please return these surveys to Mr. Mezger by Friday April 16.

Teacher Survey for WPI Interactive Qualifying Project 2004

Please take a few moments to fill out the following survey. It is being administered by Jeff Popham and Evan Desmarais as part of their Interactive Qualifying Project at Worcester Polytechnic Institute. This survey is the second of two surveys and should take no longer than five or ten minutes of your time. All of your responses will be kept completely confidential and will only be viewed by those administering the survey. However, we do ask that you please write the last four digits of your phone number in the top right corner of this page. This will allow us to compare the responses of the first survey with those of the second survey without asking names. We appreciate you taking the time to fill out this survey. Thank you.

Questions 1-5 pertain to your general use and knowledge of computer technology:

1. How would you rate your familiarity and expertise with computers?
    m) I have little or no familiarity or expertise.
    n) I can do basic tasks, such as checking email or using the internet, with little or no help.
    o) I can do more advanced tasks, such as installing my own software or troubleshooting small problems, with little or no help.
    p) I am very proficient in doing advanced tasks with a computer.

2. How often do you use computer technology to supplement your teaching methods?
    e) I do not use computers to supplement my teaching at all
    f) I encourage students to use computers, but my curricula does not require it
    g) I occasionally assign projects that either require the use of a computer or are accomplished with much greater ease if the student uses a computer
    h) I frequently assign projects that require the use of a computer as a resource

3. Do you have internet access at home?
    c) Yes
    d) No

4. On average, how many hours a week do you use the internet?
   m) I do not use the internet
   n) 1-3 hours
   o) 4-6 hours
   p) 7 hours or more

5. Do you have your own website?
   e) Yes, I have a school-related website.
   f) Yes, I have a website that is not school-related.
   g) Yes, I have at least one website that is school-related and one that is not.
   h) No, I do not have a website.

Questions 6-15 pertain to your perceived value of the internet as a learning resource and your opinion of the current state of the Somers High School website. Please respond appropriately for those classes that are currently using the web information system. Only a few of the teachers have been using this system, so their students are the only ones who have used it.

6. Do you view the internet as a valuable resource for learning?
   g) Yes
   h) No

7. Have you seen the Somers High School website?
   g) Yes
   h) No

8. How often do you visit the Somers High School website?
   m) Never
   n) Occasionally to find certain information that I know is online.
   o) Occasionally to see if anything is being done to the site.
   p) Frequently

9. Who do you think currently gets the most benefit from visiting the Somers High School website?
   m) Students
   n) Teachers & Faculty
   o) Parents & Community
   p) Nobody

10. Do you think teachers who are reluctant to use computers to supplement their curricula would be more inclined to embrace computer technology in their teaching methods if the technology was less complicated?
  c) Yes
  d) No

11. Do you think that having the ability to add resources and course assignments on the web as part of the Somers High School website is useful to teachers?
  c) Yes
  d) No

12. Do you think that having the ability to view extra resources and course assignments on the web would be a useful feature for students?
  g) Yes
  h) No. Students are not likely to make use of this feature

13. Do you now use the web to post assignments and/or resources for your students?
  c) Yes
  d) No

14. How often do you use the web information system to post homework assignments and resources?
  a) Every assignment
  b) Most assignments
  c) Some assignments
  d) Never

15. How do you think adding the ability for teachers to add and update resources and assignments on the Somers High School website has affected student traffic to the website?
  d) Students visit the Somers High School website more often.
  e) Nothing has changed, or there was insignificant change.
  f) Students are less likely to visit the Somers High School website.

16. Do you think that allowing students to view resources from other teachers who teach the same course has benefited them?

    c) Yes

    d) No, students are not likely to even bother using these resources.

Please put this survey in Mr. Mezger's mailbox once you have completed it. Thank you for completing this survey.

Administrator/Staff Survey for WPI Interactive Qualifying Project 2004

Please take a few moments to fill out the following survey. It is being administered by Jeff Popham and Evan Desmarais as part of their Interactive Qualifying Project at Worcester Polytechnic Institute. This survey is the first of two surveys. The second survey will be administered sometime in mid-April. Each survey should take no longer than five or ten minutes of your time. All of your responses will be kept completely confidential and will only be viewed by those administering the survey. However, we do ask that you please write the last four digits of your phone number in the top right corner of this page. This will allow us to compare the responses of the first survey with those of the second survey without asking names. We appreciate you taking the time to fill out this survey. Thank you.

Questions 1-5 pertain to your general use and knowledge of computer technology:

1. How would you rate your familiarity and expertise with computers?
    q) I have little or no familiarity or expertise.
    r) I can do basic tasks, such as checking email or using the internet, with little or no help.
    s) I can do more advanced tasks, such as installing my own software or troubleshooting small problems, with little or no help.
    t) I am very proficient in doing advanced tasks with a computer.

2. How often do you use computer technology as part of your job?
    i) I do not use computers at all in the workplace
    j) I occasionally need to use a computer to do small tasks
    k) I frequently use a computer to do my job

3. Do you have internet access at home?
    e) Yes
    f) No

4. On average, how many hours a week do you use the internet?
    q) I do not use the internet
    r) 1-3 hours
    s) 4-6 hours
    t) 7 hours or more

5. Do you have your own website?
  i)   Yes, I have a school-related website.
  j)   Yes, I have a website that is not school-related.
  k)   Yes, I have at least one website that is school-related and one that is not.
  l)   No, I do not have a website.

Questions 6-14 pertain to your perceived value of the internet as a learning resource and your opinion of the current state of the Somers High School website.

6. Do you view the internet as a valuable resource for learning?
  i)   Yes
  j)   No

7. Have you seen the Somers High School website?
  i)   Yes
  j)   No

8. How often do you visit the Somers High School website?
  q)   Never
  r)   Occasionally to find certain information that I know is online.
  s)   Occasionally to see if anything is being done to the site.
  t)   Frequently

9. Who do you think currently gets the most benefit from visiting the Somers High School website?
  q)   Students
  r)   Teachers & Faculty
  s)   Parents & Community
  t)   Nobody

10. Do you think teachers who are reluctant to use computers to supplement their curricula would be more inclined to embrace computer technology in their teaching methods if the technology was less-complicated?
  e)   Yes
  f)   No

11. Do you think that having the ability to add resources and course assignments on the web as part of the Somers High School website would be useful to teachers?
     e) Yes
     f) No

12. Do you think that having the ability to view extra resources and course assignments on the web would be a useful feature for students?
     i) Yes
     j) No. Students are not likely to make use of this feature

13. Do you currently use the web to post information relevant to Somers High School?
     e) Yes
     f) No

14. How do you think adding the ability for teachers to add and update resources and assignments on the Somers High School website will affect student traffic to the website?
     g) Students will visit the Somers High School website more often.
     h) Nothing will change, or there will be an insignificant change.
     i) Students will be less likely to visit the Somers High School website.

Please put this survey in Mr. Mezger's mailbox once you have completed it. Thank you for completing this survey.

Appendix B:
Web Information System
Training Documents

Administrators Guide to the Somers Schools Web Information System (WIS)

This document will show you how to:
- Login to the WIS
- Add, modify, and remove users from the WIS
- Add, modify, and remove courses from the WIS
- Maintain the databases in the WIS

Logging into the Web Information System
- Access the Somers Schools WIS by following the URL http://wpi.iccis.net. The screen shown in Figure 1 should load in your browser.
- Choose 'Faculty/Administration Access'.
- A login form will load (Figure 2). Fill in this form using your username and password. Click the button to login.

How to add users to the database
- **Step 1: Add the user.**
    - Once you have logged in, you will see the screen shown in figure 3. Choose, 'User Database Administration.'
    - You will then be given three choices: 'Add User,' 'Modify User,' and 'Remove User.' Choose 'Add User.'
    - The next screen, shown in figure 4, contains all of the fields necessary to add a new user to the database. Make sure all information is entered correctly. The system will check that the values entered into the 'Password' and 'Confirm' fields match. However, choosing the wrong department may render the user unable to update his or her course materials properly.
    - Once all of the information is filled in, click 'Add User.' A pop-up message should appear to let you know that the user has been successfully added to the system. Click OK. From this point you will be redirected to the screen shown in figure 3.
- **Step 2: Add courses for the user.**
    - Now that you have added a new user, you will have to associate that user with the courses that he or she teaches. Assuming that you are still at the screen shown in figure 3, click, 'Class Database Administration.' This will bring you to a page similar to the user database administration page.
    - Choose 'Add Course,' and fill in the necessary information. Make sure to enter a unique course number, preferably the number assigned to the course by the school.
    - You will need to choose the department that the course belongs to. IT IS VERY IMPORTANT that this matches the department that was chosen for the user above.
    - In the availability field, indicate whether the class runs all year, fall term only, or spring term only.
    - Choose the instructor from the drop-down list provided. You should be able to select the user you previously added from this list.

- o Choose 'Add Course.' This will register the user with the course in the system. You may register as many courses to one user as you like, but no two users can share the same course (based on course number). If there are multiple teachers teaching the same course, you may create duplicates of the course. However, each instance of the course must have a slightly different course number and each instance will be treated by the system as a separate course.
- o This concludes adding a new user and a new course to the system.

How to modify users already in the database
- Login to the WIS
- Choose 'User Database Administration.'
- Choose 'Modify User.'
- Choose the user you wish to modify from the drop-down box and click 'Modify this User.'
- A screen similar to the add user screen will load, except the fields will already contain the current values for the user you have chosen. Edit the fields as necessary. Any field that is unedited will store the value it previously held. If you change the user's password, you must change the confirm field to match the new password. The system checks this and will not allow you to modify the user if the Password and Confirm fields do not match.
- Click 'Submit Changes.' A pop-up box will appear to confirm that you want to make these changes. Clicking OK will make the changes. Clicking cancel will return you to the form without making any changes. Once the changes are recorded into the system, another pop-up box will appear to let you know that the user was successfully modified.
- This concludes modifying users in the database.

Modify courses already in the database
- The steps for this process are almost identical to the process for modifying users.
- Login to the WIS
- Choose 'Class Database Administration.'
- Choose 'Modify Course.'
- Select the course you wish to modify from the drop-down box. The courses are listed in alphabetical order. Click 'Modify this Course.'
- A new page will load with form fields already filled with the current information for the course. Modify the fields as necessary. If you change the department for the course, your selection must match the department of the teacher you have assigned to the course. This also holds true if you select a different teacher for the course. You will then need to select the matching department for the course.
- When you are done editing the necessary fields, click 'Submit Changes.' A box will pop up to notify you if the modification was made successfully. You will then be redirected to the main administration page.
- This concludes modifying courses in the database.

Removing users and/or courses from the database

- Login to the WIS
- Choose 'User Database Administration' if you want to remove a user. Otherwise, choose 'Class Database Administration.'
- Choose the user (or course) that you wish to remove and click 'Remove this User' (or 'Remove this Course'). A window will pop up asking you to confirm your decision. Clicking cancel will return you to the form without making any changes. Clicking OK will pop up another window to notify you if the removal was successful. Once this is done, you will be redirected to the main administration page.
- This concludes removing users and courses from the database.

Notes on password administration

Within the User Database Administration section of the Web Information System is a link to all of the passwords contained within the database. This link is aptly titled, "Password List." In order to maintain the security of the system, it is strongly advised that you do not print this list. It contains all of the current passwords for all of the WIS users, including the administrators. This feature was created for use in the event that a user has forgotten a password or in the event that troubleshooting must be done using a specific user's account. The password list pops up as a separate window and must be closed separately from the window containing the WIS.

Figure 1.

Somers Web Information Sytem

Welcome to the Somers Schools Web Information System.
Please choose one of the following options to be directed to the appropriate page:

Student Access

Faculty/Administration Access

↑

Choose Faculty/Administration Access

Figure 2.

Somers School System Faculty Login

Username: [   ]

Password: [   ]

[Click Here to Login]

NOTE:

This system is not designed to work with older
web browsers. The technologies used to build
this system are not supported in older web
browsers and will cause the page to function
improperly or look garbled. You must have one
of the following web browsers installed or you
will not be able to view this page correctly:

- Netscape Communicator (or Navigator)
  version 7.1 or greater (Windows,
  Macintosh, or Linux)
- Internet Explorer version 5.5 or greater.
  (Windows)
- Internet Explorer version 5.0 or greater.
  (Macintosh)
- Opera, Mozilla, and other web
  browsers have not been tested and are
  not guaranteed to work.

If you are having problems logging in:

*Remember passwords are case sensitive.

*Make sure your CAPS Lock key is OFF.

*Javascript MUST be enabled!

*If you still have problems, please see your
network administrator

Figure 3.

Somers Web Information System

System Administrator Control Panel

- User Database Administration
- Course Database Administration

Figure 4.

Somers Web Information System

System Administrator Control Panel

| Add User | Modify User | Remove User | Password List |

Add New User Form

First Name: [ ]
Last Name: [ ]
User Name: [ ]
Password: [ ]
Confirm: [ ]
Department: [Art ▼]

[Add User]

IF YOU NEED ASSISTANCE using the Somers
Schools' Web Information System, you can
download the appropriate user's guides here:

- System Administrator User's Guide
- Faculty User's Guide
- Students' User's Guide

Teachers Guide to the Web Information System (WIS)

This document will show you how to:
- Login to the WIS
- Upload a file to the system
- Add, modify, and remove assignments and their related resources from the WIS
- Change your password
- Attach your own website for each class

Logging into the Web Information System
- Access the Somers High School website
- On the left, there is a link titled, 'Faculty Web Login.' Click this link.
- A login form will load on the right. Fill in this form using your username and password. Click the button to login.

How to upload a file from your computer to the WIS
- Once you have logged in, you will see 4 options on the top called 'Choose assignment', 'Upload files', 'Resources', and 'Change Password'.
- Choose 'Upload file' and it will bring up a section explaining what to do.
    - Figure 6
- After reading the text, click on 'Submit' and you will be brought to the upload screen.
    - Figure 8
- Read the instructions here and name your file accordingly.
    - *teachername_coursenumber_year_description.extension*
    - **Example:** johndoe_ma2611_2004_probs1-12.pdf
- Click on the first 'Browse' button and upload one file.
- Use the other 4 browse buttons to upload more files if you so desire.
- Click on 'Upload!' at the bottom and the system will confirm what has been uploaded.
- Click on 'Return to SHS Web Information System' and you will be sent back to the login page.

How to add new assignments to the system
- Once you have logged in, you will see 4 options on the top called 'Choose assignment', 'Upload files', 'Resources', and 'Change Password'.
- Select 'Choose Assignment' and it will bring up the different options for assignments, here we are only concerned with 'New Assignment'.
    - Figure 3
- From the drop-down menu, select the class in which you want to make a new assignment and click 'New'.
- The next screen allows you to enter the assignment file, name, and due date, respectively named 'File', 'Assignment Name', and 'Assignment Due Date'.
    - Figure 2

- Press 'Submit' and the system will enter the new information and place you back at the main page.
- If you wish to add resources to the system, you will follow the same general steps, but you will choose 'Résources' at the main page instead of 'Choose assignment'.
  - Figure 5
- There will be one extra page here, but it is simply to choose the assignment you wish to add resources for, everything else is the same.
  - Figure 7

How to edit assignments in the system

- Once you have logged in, you will see 4 options on the top called 'Choose assignment', 'Upload files', 'Resources', and 'Change Password'.
- Select 'Choose Assignment' and it will bring up the different options for assignments, here we are only concerned with 'Edit Assignment'.
- From the drop-down menu, select the class in which you want to edit an assignment and click 'Edit'.
- Click on the drop-down menu on the next screen to choose the assignment you wish to edit.
- Now you can enter the new assignment file, name, and due date, respectively named 'New File', 'New Name', and 'New Due Date'.
- There is also a section here to enter or edit a resource(s) for the assignment. Either select the resource you wish to edit from that drop-down menu or leave it blank to add a new resource for that assignment.
- The field names for resources to edit are 'New URL' and 'New Name'.
- Press 'Submit' and the system will edit the information and place you back at the main page.
- If you wish to edit resources in the system, you will follow the same general steps, but you will choose 'Resources' at the main page instead of 'Choose assignment'.
- There will be one extra page here, but it is simply to choose the assignment you wish to edit resources for, everything else is the same.

How to remove assignments from the system

- Once you have logged in, you will see 4 options on the top called 'Choose assignment', 'Upload files', 'Resources', and 'Change Password'.
- Select 'Choose Assignment' and it will bring up the different options for assignment, here we are only concerned with 'Delete Assignment'.
- From the drop down menu, select the class in which you wish to delete an assignment and click 'Delete'.
- On the next page, select which assignment you would like to delete from the drop-down menu.
- It will ask if you are sure you want to delete the assignment.
- Click 'Yes' if you want to permanently delete that assignment or 'No!' if you would prefer to keep it.

- Selecting either 'Yes' or 'No!' will send you back to the main page.
- If you wish to delete resources from the system, you will follow the same general steps, but you will choose 'Resources' at the main page instead of 'Choose assignment'.
- There will be one extra page here, but it is simply to choose the assignment you wish to delete resources from, everything else is the same.

How to change your password
- Once you have logged in, you will see 4 options on the top called 'Choose assignment', 'Upload files', 'Resources', and 'Change Password'.
- Choose 'Change Password' and it will bring up the different password fields.
  - Figure 4
- Enter your current password in the first field and your new password in the second field, and again in the third field to confirm your password.
- Select 'Submit' and the system will change your password and send you back to the main page.
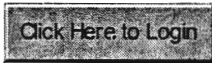
How to attach another website to a class
- Give your system admin the class name and/or number and the URL of the website that you wish to have connected to the class.
- You can connect this system with a class website or a personal website.

Figure 1.

Somers School System Faculty Login

Username: [_____]

Password: [_____]

[Click Here to Login]

NOTE:

This system is not designed to work with older web browsers. The technologies used to build this system are not supported in older web browsers and will cause the page to function improperly or look garbled. You must have one of the following web browsers installed or you will not be able to view this page correctly:

- Netscape Communicator (or Navigator) version 7.1 or greater (Windows, Macintosh, or Linux)
- Internet Explorer version 5.5 or greater. (Windows)
- Internet Explorer version 5.0 or greater. (Macintosh)
- Opera, Mozilla, and other web browsers have not been tested and are not guaranteed to work.

If you are having problems logging in:

*Remember passwords are case sensitive.

*Make sure your CAPS Lock key is OFF.

*Javascript MUST be enabled!

*If you still have problems, please see your network administrator

Figure 2.

Assignment

Course: class I teach

New file:

[   ] [Browse...]

New name:

[   ]

New due date:

[   ] [   ] [   ]

[Submit]

Figure 3.

Choose assignment   Upload files   Resources   Change Password

New Assignment

[class I teach ▼]

[New]

Edit Assignment

[class I teach ▼]

[Edit]

Delete Assignment

[class I teach ▼]

[Delete]

Figure 4.

| Choose assignment | Upload files | Resources | Change Password |

Password

Please enter your current password: [   ]

Please enter your new password: [   ]

Please re-enter you new password: [   ]

[Submit]

Figure 5.

| Choose assignment | Upload files | Resources | Change Password |

Edit resources in assignment:

[class I teach ▼]

[Edit]

Figure 6.

| Choose assignment | Upload files | Resources | Change Password |

Upload Files

Click below if you wish to upload files to the server.
Once a file has been uploaded, you can then use it for your classes.
Please remember the name that you use for this file so that you can refer to it when making an assignment with it.

[Submit]

Figure 7.

New Resource

[assign07 ▾]

[New]

Edit Resource

[assign07 ▾]

[Edit]

Delete Resource

[assign07 ▾]

[Delete]

Figure 8.

Use this form to upload a file to the server. Please be consistent with your filenames as your file will be stored in a shared directory. Using a filename that is already contained in the directory may overwrite someone else's upload. You should name your files appropriately before attempting to upload.

An example for a good naming convention would be the following:
teachername_coursenumber_year_description.extension

Example: johndoe_ma2611_2004_probs1-12.pdf

The address to access your file is:
http://wpi.iccis.net/asp/SHS_Files/*yourfile*
where *yourfile* is the filename you specified when uploading.

File:

	[Browse...]
	[Browse...]
	[Browse...]
	[Browse...]
	[Browse...]

[Upload!]

Appendix C:
Written Evaluation of the
Web Information System
By Carlos Mezger

1. I like the system because it is web based, simple, and has a user-friendly interface. The management portion is simple and helpful. It is quite easy to add and delete new users. There is a list of users with their passwords. The built in instructions is helpful. The minimum requirements to use the system is industry standard. The teacher section is simple. A teacher can quickly set up a class and populate the class with assignments, resources, and a teacher's webpage link. The ability to change passwords is great. The student portion is perfect for easy navigation.
2. No changes need to be made besides the ones we already discussed.
3. I have used the system with two different courses for a total of five classes. I add assignments on a daily basis without any problems from home or school. Students visit the site on a daily basis.
4. This system will continue to help me in the future because adding assignments and resources takes place instantaneously and I can do it from anywhere and at anytime. Therefore, the information is available to students at all times.
5. The students view the system as an extension of class in an environment very familiar to them - cyberspace. To them the pull down menu and the speed to find needed information is very important.

Carlos Mezger