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WEB PAGE DESIGN CLASS CURRICULUM
FOR THE SECONDARY LEVEL

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Masters of Arts
in
Education:
Instructional Technology

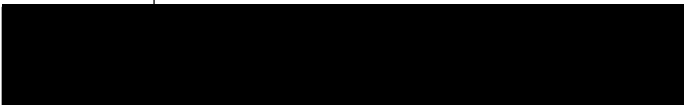
by
Corey Lamoin Knowlton
September 2002

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Approved by:


Dr. James Monaghan, First Reader

8/29/02
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ABSTRACT

The purpose of this project is to create and implement a web page design curriculum for the secondary level. The Internet has become one of the fastest growing opportunities for business in the world, yet few secondary schools are preparing students for this field. I feel that the integration of a web page design course at the secondary level will significantly increase a student's ability to access these business opportunities upon graduation from High School.

The areas of focus of this project include: Internet uses and misuses, the Internet's educational advantages and disadvantages, and effective teaching strategies of web page designing. Theories and methods of how professionalism and Internet etiquette (netiquette) are essential parts of the design process are discussed. Lastly, techniques in teaching the web page designing processes are explained.

A series of lesson plans are included to help develop student's interpersonal skills and their computer and Internet skills. All lessons are created to emphasize the importance of learning Internet skills and are written in a user friendly format. Each lesson is written so that the instructor can easily modify the plans to meet specific student or teacher needs. Each lesson is also created so

that the instructor has full autonomy to use any authoring tool and any word processing software.

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I'd like to take this opportunity to thank my two little boys, Joshua and Jacob, for giving me the needed time to finish this Thesis Project. It's been a long journey but it's finally complete. Thank you for your love, support, and the time to work on it without distractions. I'd like to give a special thanks to my great wife, Kim. While she finished her Doctorate dissertation and had our two children, she still found time to let me work on this project. She gave me the motivation I needed to finally finish. Thank you!

I'd also like to thank my readers; Dr. James Monaghan and Dr. Amy Leh. Time is scarce and spending yours to work with me is greatly appreciated.

To the friends and colleagues that I've worked with on this project, I'd also like to extend a personal thank you. Your insights and knowledge in the field of web page designing helped me tremendously.

Lastly, I'd like to acknowledge my best friend, Jesus Christ, through whom all things are possible...

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CHAPTER ONE

INTRODUCTION

Statement of the Problem

With an economy that can easily fluctuate and a job market that at times can be shaky, it is important to give high school students as many opportunities as possible when they enter the work force. I feel that by implementing a web page design course into the secondary level we are increasing each student's chances of securing a job after graduation.

Most schools are starting to implement web page design courses, and I feel that it is important to have a well grounded course curriculum established before starting the class. There are many facets to the Internet, and the more each student knows about the Internet, the better prepared those students will be when using it in the classroom.

By using this project and establishing a web page design course, I feel that the students will receive the basic skills that are needed to begin web page designing in the work place. Each student will have created personal web pages and parts of the school's web page, so they will have a broad knowledge base for web page designing. Without teaching students these skills, we are taking opportunities

away from our students that other, more qualified students may capitalize on.

Purpose of the Project

The purpose of this study is to demonstrate the importance of having web page design curriculums implemented into the secondary levels. How computer skills are developed, how proper netiquette is taught, how students as well as schools will benefit from this course will also be examined. Lastly, strategies for teaching and lesson plans will be provided and explained. 0

Significance of the Project

A review of the literature revealed that the internet has infiltrated into almost every aspect of our society (Dyrli, kinnamen, 1996a). The importance of understanding the Internet and being able to evolve with it is proving to be of utmost importance. As you read through this project and implement the lessons that have been designed, you will begin to see how the students will start to develop higher level thinking skills. They will be required to mentally organize design layouts, critically analyze other web pages and write logical reviews of different web sites. Students will also be required to learn the history of the Internet and use proper internet terminology, giving them a broader

understanding of the field and increasing their technical vocabulary.

The Internet is a learning tool that can reach every type of student. I feel that by implementing a design course like this project, an instructor will be able to effectively teach all types of students, including those that succeed with alternative learning styles. Having knowledge of the material that is covered in the lesson plans of this project will increase a student's qualifications for the Internet job market. In my opinion, this type of knowledge could prove to be the edge that some of these students need

The aim of this project is to develop a computer curriculum in which students and instructors will learn how to broaden their futures with the use of the Internet. All of the lessons within this curriculum target the secondary level student, but can be revised and implemented into any level of secondary education. This curriculum is written to be easily adaptable to the teacher's and student's needs. I chose not to select a specific piece of software, rather, the curriculum was designed to be versatile with what ever title of publishing software the instructor is most comfortable. Lessons within this curriculum can easily be altered for specific use within a school or district as

well. Because the Internet is so broad and changes so quickly, it is anticipated that new and more challenging lessons will be added to this curriculum by individual instructors, making this an evolving project.

CHAPTER TWO

REVIEW OF LITERATURE

Background

I believe that the majority of the readers of this project will be Internet users. I also believe that a majority of you users probably do not know where the Internet originated. Therefore, I feel that it is important to include a quick history lesson to help broaden your understanding about where, when and why the Internet was established.

The Web was conceived back in 1960s as the U.S. Department of Defense researched how to connect a decentralized network, called ARPAnet, in such a way as to withstand local military attacks and still function elsewhere (Varzavand, Egger and Lyle). ARPANET (Advanced Research Projects Agency Network), a packet-switching protocol was developed by Bolt, Beranek and Newman and it allowed users to send messages in electronic envelopes to other users connected to the network. This has come to be known as the predecessor to the Internet as we know it today (www.bbn.com/timeline/60.html).

In 1989, at the Center for European Nuclear Research (CERN) in Geneva, Switzerland, a form of the Internet was developed for sharing scientific information (Hill, 1996).

In 1993, the National Center for Supercomputing Applications (NCSA) at the University of Illinois published the Mosaic browser with the graphical interface that we are currently used to seeing (Hill, 1996, Dyrli, 1995b). Since that time, the ease of use and the amount of resources available on the web have grown tremendously. In 1994, it was estimated that the Internet had an annual growth rate in excess of 3,000 percent (Eager, 1994). Wilson and Utecht estimated that in 1995 the Internet was increasing by as much as 10 percent each month (1995).

In 2000, Mr. Bill Gates, Chairman of the Microsoft Corporation wrote an article on how the Internet was taking shape. He stated that at the beginning of 1994 there were only about 500 web sites worldwide. He went on to write that it was estimated, at the time that his article was being written, that the Web had close to 3 billion pages. As he continued the article he stated that because computers are cheaper and more powerful, and because of the higher-speed Internet access and the advancement in software development, the growth cycle of the Internet would continue and possibly even accelerate (Gates, 2000).

What is the Internet and what is it made of? The Internet and the World Wide Web are based on computing standards. Three key standards that need to be identified

are Hypertext Transfer Protocol (HTTP), HyperText Markup Language (HTML), and Uniform Resource Locators (URL). HTTP is the standard which makes it possible to follow a link from one document to another document. HTML is a type of language in which Web documents are written in order to be viewed by World Wide Web browsers. Finally, URL addressing standards make it possible to connect to a specific source on the Web (Varzavand, Egger and Lyle, 1998).

Documents on the World Wide Web are known as pages and pages can be made from four different pieces of information. Each page may contain: (a) a series of markers called "tags," (b) the text to be displayed, (c) references for images to be displayed, and (d) hypertext links which point to other Web pages (Lemay, 1995). These links can direct you to pages within your particular site or other pages anywhere on the Internet. Web publishing tools or word processing software can be used to create a web page. However, if a word processor is used, the file needs to be saved in ASCII form (Hill, 1996). Web publishing software is specifically designed to take care of this step for you.

After a Web page has been created, the file is transferred to a computer that is connected to the Internet. The creator will have to find a server on the Internet that will host the web page. Some servers are

7 free, while others charge a fee. After a server has been selected to host the page, the web page will be given a universal resource locator (URL) address (Hill, 1996). After this has been completed, the web page can be accessed by anyone on the Internet. An Internet user would have to type the URL address into their browser's (software designed to access the Web) address line. The page would then be loaded and the browser would display the text or images that were created (Hill, 1996).

What does the Internet look like? No one really knows how the Internet is actually laid out because there is simply too much data and too many pages (Burch and Cheswick, 1999). In fact, some companies do not even know what their local networks look like because of their vast sizes. It is estimated that even mapping the major backbones in the US would produce a solid sash of ink from New England to California (Burch and Cheswick, 1999).

Uses for the Internet

There are two major functions of the Internet; Commercial use and Educational use. It is estimated that commercial Web pages total about 53%, educational Web pages total about 18% and all other Web sites make up the remaining 29% (Turau, 1998). These three groups have very different purposes for publishing web pages. The 29% of

unmarked sites are comprised of sites like family home pages and do little more than simply display text and graphics for a select number of viewers. The educational Web sites are vastly used for displaying institutions of study and for researching information. The largest group, commercial Web sites, is primarily designed for creating revenue (Turau, 1998). Recent figures indicate that between 75 and 90 million Americans regularly use the Internet (Sholtz, 2000). With such a large number of people surfing the Internet, researchers have found that Internet sales of goods on line had jumped 175 percent from 1995 to 1998. They also found that employees who work for companies with Internet-related revenues are 65 percent more productive than their counterparts (The Washington Times, 1999). In total, this same Washington Times article stated that companies doing business on the Internet generated \$300 billion in revenue and created more than 1.2 million jobs in 1998 alone (The Washington Times, 1999).

Misuses of the Internet

There are some down sides to this "new" technology, however. Information on almost anything is widely available, but unfortunately that can be a negative aspect of the Web as well. Personal information has become the new currency of online commerce (Sholtz, 2000). Very few

Internet users actually pay for network content they view or print. Instead, many sites ask for personal information in the form of "registering". Many content providers will then collect, buy and sell this personal information. It is stated that personal information is the lifeblood of the Internet economy (Sholtz, 2000). It is essential that you take caution when giving personal information over the web.

A report by Jupiter Communications, issued in June, 1999, indicated that as much as \$18 billion in lost revenue in e-commerce may occur by 2002 if consumer concerns about privacy are not addressed (Jupiter Communications, 1999). The FTC further estimates that misappropriations of personal information accounts for over \$40 billion a year in telemarketing scams (Garfinkel, 2000b). This is yet another reason to be very cautious when giving out personal information over the Internet or over the phone, especially to people or organizations that you know little about.

There are over 550 million credit reports sold annually in the United States (Garfinkel, 2000a). It is very easy for good credit to fall into the hands of the wrong person with this many reports being exchanged every year. Nobody is certain of exactly how many identity thefts occur, but it is estimated that between 100,000 and 400,000 cases happen annually in the United States (Garfinkel,

2000a). Again, it is very important to know exactly to whom and where your personal information is going when on the Internet and on the telephone.

The web's remarkable dynamic nature, which is its most attractive quality, is also the major drawback to providing web access in the classroom (Wagner and Wagner, 1997). Many teachers and parents have concerns of the violence, nudity, gross depictions, gambling, and other materials that are readily available on the Internet. There are several software packages on the market that can help block unwanted sites from a child's viewing, however there are not any programs that can effectively eliminate all adult information (Wagner and Wagner, 1997). School districts and some counties have also installed "fire walls" that stop the viewing of adult material through the use of key words. However, if a web publisher labels a site "1999 automobiles" and displays nude photographs instead, there is very little a fire wall can do to stop this type of site. This type of screening is virtually impossible to detect and sensor.

Educational Advantages and Disadvantages

Using the Internet in the classroom opens up doors for learning that previously didn't exist. Information and learning experiences are no longer limited to a school site

or a classroom, but are now distributed across global networks (Dyrli and Kinnaman, 1996a). This one advantage, in my opinion, outweighs the disadvantages by itself. However, there are several opinions that need to be considered before a conclusion can be made.

As an instructor in a computer lab, I find that all students react with emotion while working on the computers. Some of their emotions are predefined by past experiences and some are acquired while working within my class. These emotions can work to the advantage of a student, but can also prove to be a hindrance to the student's learning process. It is the instructor's responsibility to capitalize on the emotions that promote learning and avoid the emotions that may negatively affect a student's learning. Astleitner, Hermann, Leutner, and Detlev have researched five base emotions that students face while receiving computer based instruction; fear, envy, anger, sympathy and pleasure. 1. Fear is a negative feeling arising from subjectively judging a situation to be threatening or dangerous. 2. Envy is a negative feeling resulting from the desire to either get something that others possess or not lose something one already possesses. 3. Anger is a negative feeling coming from being hindered in reaching a desired goal and being forced to an

additional action. 4. Sympathy is a positive feeling referring to an experience of feelings and orientations of other people who are in the need of help. 5. Pleasure is a positive feeling based on mastering a situation with a deep devotion to an action (Astleitner, Hermann, Leutner and Detlev, 2000). I would like to add a sixth emotion that I find quite often with new computer users; anxiety. A student's anxiety about using a computer or the Internet can be quite high (Presno, 1998), however, effective teaching strategies within the classroom and the use of email and discussion groups outside of the classroom, those anxieties can be eased (Dyrli, 1995a) (Presno, 1998). The instructor must analyze emotional problems before and during instruction. Fear, envy, anger and anxiety should be reduced during instruction and sympathy and pleasure should be increased (Astleitner, Hermann, Leutner and Detlev, 2000).

One of the greatest criticisms against traditional school curriculum materials is that the content is not connected directly to the lives of students, can become outdated, and is seldom individualized according to learner interests and abilities. In contrast, through the use of the Internet, immediacy and individualization is brought into the schools curriculum (Dyrli and Kinnaman, 1996b).

Individualizing a student's curriculum is a process that can bring more meaning and personal satisfaction to a student's learning experience. Erickson and Connell suggest that creating hypermedia documents for themselves gives learners "the opportunity to see knowledge in a fundamentally new way, as a result of their constructive efforts rather than as a set of givens from their teacher and text" (Erickson and Connell, 1994). In further research, Lachs and William found that all learning is a process of "making meaning." They also stated that the learning process is effective only when meaning is constructed by the learner himself (Lachs and William, 1998). This web page design class curriculum project is designed to give students the opportunity to use their own creative skills and make their own "meaning."

The use of the Internet transforms the learning process for students. Students will learn to become more active and self-directed. The use of the Internet will help students recognize that the knowledge they are acquiring is for a specific purpose. This new knowledge is a source of power for these students and it begins the first moment that it starts to form in the student's mind (Papert, 1980).

Another educational advantage was found in Cohen's research indicating that schools that are actively engaged in reform efforts can have a positive effect on student learning levels. Schools that establish a technology rich classroom and employed project based teams that solved problems were among those schools. Cohen also indicated that the reduction of the lecture format of instruction can have a greater effect on student's learning (Cohen, 2001).

Two of the biggest disadvantages that schools find when using the Internet are: the connection speed to the Internet and the ways that teachers are using the Internet within the classroom. Most larger public school districts are connecting to the Internet via the district's local area network (LAN) (Kinnaman, 1995). However, there are still schools that are using a modem and dial-up connection. The dial-up connection is too slow to meet student needs and it only allows one or two classroom computers to be connected (Kinnaman, 1995). Access to a dial-up connection is often the point of failure for network subscribers as well (Snow, 1999).

Beneficial Uses in the Classroom

To be able to properly utilize the Internet in the classroom, teachers need to learn how to use the Internet as a teaching tool. Some teachers have not adapted their

curricula to take advantage of the Internet, but instead have modified their curricula to be Internet-tolerant (Kessler, Rosenbald, and Shepard, 1999). Teachers tend to be the primary source of supervision for students accessing the Internet as well. These two statements suggest that Internet skills and knowledge should be incorporated into program development and teacher preparation programs (Flowers and Rakes, 2000). Every district that is going to be using the Internet as a resource for instructors and students needs to make sure that teachers have the proper training on how to successfully make the Internet an interactive learning device. Many instructors are presenting traditional educational material on the Internet with little consideration of the Internet's unique features (Doherty, 1998).

It is proposed that the Internet has three key features that characterize its usage and usefulness. First, teachers need to use the Internet's presentation applications; Single-media, Dual-media, and Multimedia presentations. Secondly, the Internet's one-way, two-way, one-to-many, and many-to-many, communication assets need to be utilized. Thirdly, the use of dynamic interactions such as navigation, inputs, and human feedback should be practiced (Doherty, 1998). It is quite obvious that the

Internet provides teachers and students with communications opportunities that bring reality to the classroom in ways that no other teaching resource can begin to duplicate (Dyrli and Kinnaman, 1995). Technology Education departments all over the country are starting to implement sections of Internet usage into their curriculums because of the need to prepare students for the workforce. In California, the Department of Education has defined Technology Education as courses that prepare kindergarten-through-university students for successful transition to the workforce and participation in the home, community, and post-secondary education (California Department of Education, 2000). By implementing Internet usage courses into the school's curriculum, schools are giving students a greater opportunity for finding work.

The Washington Times recently published an article giving examples of how students were creating Internet businesses and using the Internet as a business source for summer work (The Washington Times, 2001). This is the basis for which I have formed this project. There are innumerable opportunities for students to utilize the Internet for job opportunities. However, this project will solely focus on web page designing. I feel that it is our responsibility as teachers to introduce these opportunities to our high

school students and give them the knowledge base to capitalize upon them.

Teaching Web Page Designing

Teaching web page designing in schools gives students the opportunity to use the knowledge they learned from the instructor's lectures and demonstrations to simulate a hands-on work experience, which has been a proven learning tool (Jonassen, 1988). A student can use this knowledge to create personal or family web pages where they can display or express their personal interests, use the information as a stepping stone for future work or studies or just have a broader understanding of the Internet (Wood, 2001). These pages will not be published onto the school's web site because of legal ramifications, but the students will have the opportunity to publish them on their own.

A practical way for students to learn web page designing is to have the students create and maintain a school web page (McKenzie, 1997). A school site web page serves the students, teachers and community members. It can be used as an introduction to the school, a resource for school information, a publisher of student work, and a resource for educational links (McKenzie, 1997). As the students work on the creation of this site, students will be learning the basics of designing, such as; adding

hypertext links, editing pages, and inserting text and images from remote web sites (Wood, 2001). The more time students spend working on designing web pages they will learn more of the specifics like establishing visual hierarchies, directing a readers attention, adding graphics as assets to the site not distractions, and also being consistent with style, colors, graphics and texts (Lynch and Horton, 1997). Students also understand and retain the concepts of web page designing more when they generate their own examples of the design ideas being presented (Jonassen, Grabinger and Wilson, 1990).

When instructors are preparing lessons for Internet work, David Jonassen, along with two other authors, give some good examples of how to actively include the students into the lectures. He suggests using semantic maps (a "mind map") to organize lectures. These are skeleton outlines of the lectures that students can use and fill out during the course of the lectures. These maps visually convey the hierarchical relationships between ideas (Jonassen, Beissner and Yacci, 1993). The basic premise of the Internet is also a myriad of small semantic maps referred to as web sites.

Some of these web sites have been thoroughly thought out and have very creative designs. Unfortunately, the

Internet is full of pages where their authors have not learned some of the proper design fundamentals and have designed poor sites. Cleborne Maddux stated that if web authors would learn to simply proofread, revise and use a little common sense on what and when to publish, the web would have fewer poor quality web pages (Maddux, 1998). It is my hope that by teaching student the proper techniques of designing, they will learn a valuable lesson that so many web authors have not learned.

Another valuable lesson that can be learned as a page is developed and designed is the Internet's code of ethics. As with anything that is published, a certain form of etiquette needs to be followed. To Internet users this is called, "netiquette" (Dyrli and Kinnaman, 1996a). The term "netiquette" simply means to use proper etiquette while on the Inter"net". One of an educator's biggest concerns is for students to learn proper netiquette while creating web pages, especially in the area of copyright issues (see APPENDIX A).

The Internet has brought about many issues regarding copyright laws. There are many that feel that the material on the Internet should be community property- free for everyone to use. However, the Internet doesn't operate that way. There are copyright laws and restrictions that dictate

what can and can't be used when an author publishes a web page. However, few of these laws are regulated and patrolled. As a general rule, unless teachers or students have requested and received formal permission, they may not safely use someone else's materials when publishing on the web (McKenzie, 1996).

There are, however, some exceptions to the rules for teachers, students and schools. This exception is known as "fair use" (McKenzie, 1996). The "fair use" policy states that teachers are allowed to make "fair use" of materials for instructional purposes. "Fair use" has been interpreted to include those limited uses which are not likely to deprive a publisher or an author from income (McKenzie, 1996, Rice, 1998). When this concept is applied to Internet resources, a teacher should use the same theory as with printed material. A teacher or student can make limited use of downloaded materials but should not "publish" that information across other classrooms within the building on a local area network or across other classrooms in other buildings on a wide area network or the World Wide Web (McKenzie, 1996, Rice, 1998). Schools should be very careful in what is published on the Internet because a district is liable for everything that a class, student, teacher or administrator publishes on its web site. This is

a very valuable lesson for students to learn because if and when they decide to create web pages, they will be liable for the material that is published on their sites.

As the Internet is integrated into a school's curriculum and to meet the demands of a changing society, it is vitally important for schools to establish an "Acceptable Use Policy" (AUP) that sets standards for responsible use of the Internet (Dyrli, 1996a, Day and Schrum, 1995). Those students who choose not to abide by the rules set up in the AUP and who use the Internet for accessing and viewing inappropriate materials usually lose their rights of using the computer or the Internet (see APPENDIX A).

Online Resources

The Internet has an endless supply of educational resources that teachers and students can access. These resources are an essential part of the web page design process. Being able to gain outside information quickly and easily is very important. This is one of the facets of the Internet that makes it so diverse. You can access information on virtually anything, anyone, and anywhere. With that kind of information readily available, it is important to know how and where to access it. Search engines are online tools that find web resources according

to key words and phrases that you enter, and then takes you to the ones you choose (Dyrli, 1995b). A few search engine examples include: www.yahoo.com, www.google.com, www.infoseek.com, www.lycos.com, www.webcrawler.com. There are hundreds of different search engines available for our use, but some will meet our needs more than others (see Search Engine Lesson Plan, Chapter Four). Finding a preferred search engine takes several searches of many sites. Everyone has different skill levels of using the Internet and we all search for different topics, so finding a search engine that meets your specific needs may take a lot of trial and error experiences. Barry Willis, an editor of the Educational Technology journal concluded that web search engines must be designed in ways to permit effective use of their content in a time-efficient manner by users with a variety of different skills and expertise (1998). This makes the design of these types of sites challenging and it also makes the use of these sites unique for all who use them. With plenty of practice, students will find that search engines are an integral part of research and design.

Conclusion

This review of literature indicates that there is a true need to supply students with more knowledge from the use of the Internet. There are numerous opportunities for

students to broaden their knowledge base specifically through the implementation of a web page design course. The Technology market tends to fluctuate sporadically, but there is no question that the Internet is here to stay. That is why I feel the importance and responsibility to give our students every opportunity possible to tap into potential job openings. I also feel the responsibility, as a teacher, to teach students how to become critical thinkers so that they can make informed decisions when on the Internet. There are many "pitfalls" that are associated with the Internet and we need to help our students capitalize on the opportunities and be well informed of the potential dangers.

CHAPTER THREE

CURRICULUM DESIGN

Prerequisites

This course is being designed with the assumption that a student will have at least a moderate background in computers. I am recommending that a student complete at least one semester course in Computer Applications prior to taking this design course. This will give students the knowledge base that will be required to work efficiently in web page designing. It will also ensure that the students in the design class will have been at the school for at least one semester. This is important because students in this design course will be required to conduct interviews with teachers, department chairpersons, administration and coaches. Having an understanding of the school and some of the staff will make interviewing more comfortable for the students and the faculty.

Hardware Requirements

It is necessary for the user of this curriculum to have full access to a computer that is connected to the Internet. It would be preferable for this curriculum to be used in a computer lab where every student has access to a student computer and every computer is connected to the

Internet via the school's network. However, if modems are the means for Internet access, they will work, just at a slower connection speed.

I recommend that if students are working with PC's that they have at least the following specifications: 100 MHz processor, 16MB RAM, 28.8kbps Modems, 1.2GB Hard Drive. Any computer with less than these specifications will run too slow to be a functional part of the class. Even these specs are incredibly old in comparison to what is on the market today, but they will at least get you by.

If you are running on the Macintosh platform you will need to have at least the following specifications: A Power PC with 100Mhz processor running OS 7.0, 16MB RAM, 28.8Kbps Modem, 1.2 GB Hard Drive. Again, as with the PC, this is the bare minimum that a student will be able to use in the classroom. Anything less will be too slow to be effective.

Software Requirements

I found that Microsoft's FrontPage was the most versatile authoring tool because of its interactivity with the other Microsoft applications. Most students are familiar with Microsoft products because it has the most commonly used word processing program available on the market. Most schools and offices are typically using Microsoft products as well, so it makes sense to use the

authoring tool that most students can relate with. I will be using FrontPage as the basis for this course curriculum, but the lesson plans will be written in general terms that will allow you to use which ever authoring tool you are most comfortable with. If you do not have an authoring tool available for your use, there are some word processing programs that also have web page design capabilities. Corel's Word Perfect and Microsoft's Word for example, both have design functions.

I am recommending that PC users have at least Windows 95 operating system running and some form of web browser installed. Macintosh users should be using operating system 7.0 or better with some form of a web browser installed and operable (i.e. Netscape Navigator or Microsoft Internet Explorer).

Course Overview

This course is designed to fit into a one semester block that most high schools are familiar with. A second semester section could easily be adapted, but this project will focus on the first section only. I will however, mention how to set up the second semester course because it is a crucial part of the web page maintenance program.

The first semester Web Page Design course will teach students the basics of:

- Using proper netiquette
- Using search engines effectively
- Understanding Internet terminology
- Evaluating and critiquing web pages
- Creating web page story boards for design and layout purposes
- Interviewing and photographing subjects for web page information
- Designing web pages
- *Maintaining web pages

(See Chapter Four for detailed lesson plans)

* This is the basis for the second semester course. It would entail the reevaluation of the created pages, continual communication between web page subjects and their activities, and the addition, subtraction and revision of new or outdated pages.

Lesson Plan Design Rationale

This Design course was established by using a variety of resources for the lessons. I used interviews with other teachers, journal articles, the internet, and personal experiences to draw to the conclusions that I made regarding curriculum. I will indicate which sources I used

as I break down each topic that is covered. I feel that it is important for the reader, and potential user of this project, to know:

- why each specific topic was chosen
- why I suggest teaching the lessons the way they are presented in this project
- why I have included the materials for these lessons
- what the strengths and limitations of each lesson are

Lesson Plan One Rationale

This lesson was broken down into three different sections. I want the students to know the copyright laws that exist for use on the Internet and why they exist. I covered the ways that students and teachers can use the "fair use" policy when using material from the Internet. Lastly, I included the use of proper etiquette (netiquette) when working or playing on the Internet.

From a teachers point of view, it is crucial to establish the "dos and don'ts" with the students before anything else is covered. This gives the students the needed boundaries for establishing a working environment among their peers. When starting to work on the Internet, the students need to know that there are "dos and don'ts" there too. By teaching students about copyright laws, fair use policies and the use of proper netiquette during the

very first lesson it establishes boundaries that the students will have to learn to work within (Oliver, 2000).

School districts also set up limitations that the students must work within. Schools use Acceptable Use Policies (AUP), that indicate what is allowed and what is not allowed when a student uses a computer at school (Dyrli, 1996a). I have included a sample AUP as Appendix A. If a student has not signed an AUP for your specific school, this would be a good time to give one to each student to sign.

For each of the three sections in this lesson, I have chosen to use the "hands on" approach for teaching. The students are required to look up definitions on the Internet, write those definitions, verbally tell the teacher the definition and watch the teacher write the definition on the board. The students will then open a word processing file and type the terms and definitions in a file that they will label, "Technical Terms." Students will continue to add more definitions to this file as the semester progresses. This gives the students four different forms of exposure to the definitions before moving on to the next lesson.

Students will also be creating a portfolio of material that they will be collecting throughout the duration of

this course. They will be required to bring in a three ring binder into which they will be able to collect reference material. The collection of this material will be important for the students to use as a reference guide. As the days and weeks of the semester go by, students will not retain all the information that they learn, and this portfolio will be available to them to look up forgotten material. For this first lesson, the students will be required to keep a photo copy of the schools AUP with their signature.

This lesson is intended for use in a computer lab setting. It is written with the intent that every student will have access to a computer that is internet capable and has a word processing program installed. With this type of classroom setup, I feel this is a very effective lesson plan. If a computer lab is not available, and only a few computers are accessible to the class, this lesson will have to be modified to fit those situations.

Lesson Plan Two Rationale

This lesson was created to help teach students how to use a search engines effectively and efficiently. In the classroom setting, there is a limited amount of time that a teacher has to give the information that a student needs and then for the student to put that information into practice. Therefore, I feel it is essential to help

students make the best use of their time. Search engines can be very helpful if used properly, and very frustrating if they are not.

Students learn how to use search engines by doing controlled searches set up by the teacher. I have also included an online search tutorial that will take each student through a step by step process of using key terms and search engine tips.

Once again, I feel that the "hands on approach" is the best way for students to learn the concepts of this lesson. The students are involved with the learning process and they will absorb the information quicker and retain it longer with this form of learning. The students will also be instructed to open the "Technology Terms" file that they started in Lesson one and type the new terms from this lesson in that file. When the students read through the previous terms, they will be reviewing previously learned material and reinforcing their vocabulary.

Students will be asked to keep a copy of the key terms used in search engines in their portfolios. This list of key terms will serve as a reference guide so that if the students forget during the next few lessons, they can quickly look them up in their portfolios.

This lesson is also designed to use in a computer lab setting. It is a very effective lesson for the students because they are directly involved with the learning process. I have used this lesson in the classroom setting and the students excelled greatly. If there are only a few computers accessible to the class, the instructor will have to modify the lesson to meet the needs of the smaller audience.

Lesson Plan Three Rationale

The students have already established a word processing file of technology terms, so this lesson was created to enhance that list of terms. At this point in the semester, the students will have approximately fifteen terms in their saved file, but it is important that they start to broaden their vocabulary and knowledge of more Internet terms.

For this lesson, the instructor will have the students use a search engine to look up web sites that have Internet terms. Students will find those terms, and type them in alphabetical order in their technology terms file. The students will be required to collect and type 50 terms in all. This will help the students with their typing skills and it will also reinforce the terms that they are learning in class. When the students finish typing the list, they

will print out a copy and place it into their portfolios for future reference.

I feel that repetition in the learning environment reinforces a student's knowledge. This lesson seems to be quite repetitive, but in my professional opinion, it reinforces the student's knowledge and it reinforces the information that the students learned in the previous lessons.

This lesson was created for the use within a computer lab setting, however, I have included a copy of a list of Internet terms in Appendix B for those teachers that only have access to a few computers in the classroom. This list of terms can be photo copied and given to each student to be placed in their portfolios instead of having each student type their own.

Lesson Plan Four Rationale

In this lesson students will be taught how to evaluate and critique different types of web pages. The critiquing process is used to help students know what is considered good web designing and what is considered poor web page designing. The students will use the evaluation process to reevaluate and enhance their own web page designs.

This process is an essential one for the novice designer. Many students are unaware of proper and improper

page designs. When a student sees the differences between good designs and poor designs, and is able to distinguish between the two, they will tend to use that information in their own designs.

I have included a copy of a web page evaluation sheet that a teacher can use in class. It is important that the teacher reviews this sheet with the students before it is used. Every student should understand the questions on the evaluation sheet and they should know why the specific questions are being asked. The teacher will then give several copies of this evaluation form to each student. The copies that the students do not use should be placed in their portfolios for future use. The students will all log onto two sites that are the same for all students. After the evaluation has been made by each student, the teacher will discuss the differences between the two sites and the differences between the two evaluations. By holding a class discussion about the two sites, every student should be able to distinguish between the good and the poor design aspects.

This assignment can be a very useful one for the students if the teacher prepares the students properly. The teacher needs to enforce that it is design content that is being evaluated and not the person or topics of the page.

The teacher should also explain to the students how to tactfully critique other person's designs as to not offend or hurt the designer's feelings.

Lesson Plan Five Rationale

This lesson was designed to teach students how to create a web site with paper and pencil before putting it onto a computer or the Internet. Students will be learning how to use storyboards and flow charts to determine the layout, size and shape of their web pages. Using storyboards give the designer a plan to construct with. Without this plan, the web page would not have a well rounded design. It would be like a construction worker trying to build a house with out a set of plans. A good web site, just like a house, starts with the creation of a set of plans.

For this lesson, the teacher will show the students how to construct a detailed storyboard on the board. Students will take notes and copy that storyboard into their portfolio. The students will then be given a web page topic and asked to create a storyboard of their own. The students will be able to use their notes and the storyboard handout that I have provided in Appendix D to create a storyboard of the assigned topic. Students will then match up with a partner and critique each others storyboards.

This serves as a review from Lesson four and it also helps the students create better designs.

This lesson works well if the students have a good idea of the topic that they are creating the storyboard for. It is important for the teacher to choose topics for the student's storyboards that are interesting to the students. Without the student's interest, the storyboard does not get the detail that it needs to have.

Lesson Plan Six Rationale

This lesson was created to help students learn how to conduct meaningful and informative interviews. When the students create and maintain a school web site, they will have to do many interviews and gather information from other students, teachers, coaches and administrators. To create an informative web site, the students are going to have to know what questions to ask and how to ask them.

This lesson will teach students the importance of having good communication skills as well as good interpersonal skills. If a student is unprepared for an interview and doesn't know what they are going to ask, the interview turns out to be a waste of time for the interviewer and the interviewee. However, if a student knows what to ask and has practiced the interview using relevant questions, they will be a successful interviewer.

I have included an Interview Guide sheet in Appendix E to help the students come up with relevant questions that pertain specifically to the topic. If the students use this guide as a reference for creating their own questions, the interview should run smoothly.

This lesson has many positive aspects to it but can be limited to the students comfort level with other people. If a student is not afraid of interacting with others, than by following the teachers instructions and by using the Interview guide, the student can very easily be a successful interviewer. However, if the student is apprehensive around others and doesn't practice the interview process, this lesson may not be as successful as it otherwise could.

Lesson Plan Seven Rationale

This lesson is the first of two that involve the creating and publishing of web pages. In this lesson, the students will be creating a personal web page with a topic that is interesting to them. They will learn how to create the page and add personal formatting to it. For instance, the students will add background colors, pictures, graphics or audio clips, and links to other web sites. This lesson really gains the students interests while teaching them the art of designing web pages. Most students will put a lot of

time and effort into this assignment because they are creating a site about themselves. A topic that most teenagers are very interested in.

This is a very important lesson because it is the precursor to building the schools web site. This assignment teaches the students the fundamentals of web page designing and allows the students to use their creative minds to accomplish their objectives. Students learn the best when they are using hands-on learning, and this lesson is geared toward that type of learning.

The teacher should find some similar sites that other people have created to use as examples. The students will then use the web page evaluation sheets that they have in their portfolios and find a site that they can model their web page after. This will help the students make an informed decision about the layout for their personal web page.

At this point in the semester, the students are either very interested in this class or they are not interested at all. With that said, this lesson is limited by the creativity and the motivation of the students. If they are interested, they will do an excellent job, but if they are not interested, the quality of their project will show it. After this project is complete, the students will be

assessed by their peers using the web page evaluation sheets that are provided.

Lesson Plan Eight Rationale

This lesson is a culmination of all the other lessons. Each of the previous lessons was taught in preparation for this final lesson. In this lesson, students will create a functional school web site. Each student will be given a school department, sport, or club and they will create an informative web page about that area. All of the areas, upon completion, will be added to the main school site. The maintenance of this site will be the premise for the second semester class.

This is an important project because it gives the students their first "real" web site design project. It is a functional site that can be used by anyone interested in gaining information about the school.

I feel that it is important for this project to be the last project of the class because all of the other lessons were taught to give information about this project. Without that previous knowledge, the success of this site would be hindered.

The ultimate assessment for this lesson will be the reaction of the other people at the school. If the site has good designs and has credible information and is well

thought out with quality workmanship, the project will be a success. If any of these areas are lacking, the web site will not serve its full intended purpose.

Again, the success of this project is directly related to the dedication of the teacher and the students. If the teacher and students are willing to put in the amount of work that it requires to establish a quality school web site, than the site will be successful. However, if there is a lack of dedication it will directly be displayed in the web page.

Conclusion

In this project of creating a web page design curriculum the merits and possible down falls of the Internet were studied. By using this course curriculum I believe it is evident that through effective teaching the merits outweigh the shortcomings.

Technology has increased at astronomical rates over the past few years and schools are doing their best to keep students abreast with the latest it has to offer. Specifically speaking, the Internet has grown to be a dominating force in the commercial arena and in the educational field. The world is being pushed to "get connected" and schools are heading that call.

The educational possibilities that the Internet has to offer are endless. Unfortunately, with everything good comes a little bad. The Internet has a negative side that does not belong in the school setting, and it definitely does not belong at the access of young people. This is why districts and counties have instituted firewalls into their networks. These firewalls block inappropriate information from reaching the classroom. Schools have also incorporated Acceptable Use Policies (AUP) that define permissible behaviors by students and staff while using the computers at a school site (see APPENDIX A). Teachers have a responsibility to their students to always use and show appropriate information while working on the Internet.

I feel that it is a school's responsibility to give students every possibility for further education and for employment through the subjects that are taught. With the Internet growing as quickly as it is, the employability of the Internet is growing too, thus the basis for this project. Schools need to give students the knowledge of web page designing so that they can take full advantage of one of the quickest growing job markets in the world.

I also think that it is important to make this project as versatile as possible. All schools use different forms and brands of software, so this project has been created so

that any authoring tool can be used. The terms and vocabulary that are used are broad, general terms that are valid with any computer platform. The assignments and lesson plans have also been created with no particular software recommended, accept that it be some form of authoring tool. I feel that by using this type of format, more teachers, and thus, more students can benefit from this project.

This project was created to give responsible teachers a better opportunity to empower their students. The Internet is a very powerful tool, and if used responsibly, it can lead to a very rewarding future for students.

CHAPTER FOUR
CURRICULUM LESSON PLANS

Lesson Plan One

Title:

Learning to use copyright laws, fair use policies and putting "netiquette" into practice.

Description:

This lesson will teach students about copyright laws that exist on the Internet, why students and teachers have a "fair use" policy, and it will teach them how to use proper netiquette while online.

Goal:

Students will gain an understanding of what copyright laws are and why they are important to follow when designing and publishing web pages. Students will learn that teachers and students may use some copyrighted materials in the classroom. Students will also learn to respect others and web sites by showing proper netiquette.

Objectives:

Students will read and print a copy of internet copyright laws. Students will determine what factors make copyrighted work "fair use". Students will research and find the limitations for using the following materials:

Motion Media, Text Materials, Poetry, Music, Lyrics, Music Video, Illustrations and Photographs.

Students will learn the difference between freeware and shareware.

Students will find and copy the definition of netiquette.

Students will find and copy the definition of flaming.

Background:

In the business of web page designing there are some limiting factors as to what is available and what is not available for use. By instituting copyright laws on created work, it protects those people from losing work and possible revenues. Students and Educators have some limited rights to use copyrighted material as long as it doesn't infringe on possible loss of income for the creator.

Using proper netiquette while on the Internet will also teach students to be more respectful of others and their works.

Procedures:

- I. Introduce concepts
- II. Ask students for their concepts of copyright issues
- III. Have students use a search engine and find three sites that list copyright laws.
- IV. Have entire class decide on a good site and everyone log onto that site.

- V. Ask students to answer orally as the teacher writes on the board the fair use guidelines for educational use of:
- A. Motion Media
 - B. Text Material
 - C. Poetry
 - D. Music, Lyrics and Music Video
 - E. Illustrations and Photographs
- VI. Have students find the definition of netiquette and flaming
- VII. Write those definitions on the board as well.
- VIII. Have students open a new word processing document, title it "Fair use and Netiquette" and have them copy what was written on the board.
- IX. Have students print and save this information in a folder for further reference.

Materials:

Computers, Internet access, white board, word processing program, printers

Assessment:

Students will be graded on whether they do the assignment or not. It will also affect their web page design assignment grade if they don't follow the laws learned in this lesson.

Follow-Up:

Students may be given a pop quiz to reinforce the necessity of learning these laws.

Lesson Plan Two

Title:

Learning to use a Search Engine to effectively research and find needed information.

Description:

This lesson will teach students how to use a search engine effectively and efficiently to get the specific results that they want.

Goal:

Students will be able to find specific topics while searching on the web without having to look through literally thousands of sites that search engines locate.

Objectives:

Students will use search engines to locate specific topics. Students will learn and demonstrate understanding of a Boolean search.

Students will make a list of search techniques using a word processor and students will learn from an online tutorial.

Background:

Search engines are very different from subject directories. While humans organize and catalog subject directories, search engines rely on computer programs called spiders or robots to crawl the Web and log the words on each page.

With a search engine, keywords related to a topic are typed into a search "box." The search engine scans its database and returns a file with links to web sites containing the word or words specified. Because these databases are very large, search engines often return thousands of results. Without search strategies or techniques, finding what you need can be like finding a needle in a haystack.

To use search engines effectively, it is essential to apply techniques that narrow results and push the most relevant pages to the top of the results list

(<http://home.sprintmail.com/~debflanagan/main.html>).

Procedures:

- I. Introduce Concepts
- II. Have students log onto the Internet and find their favorite search engine.
- III. Ask students to do a search on a topic chosen by the instructor
- IV. Collaborate with students about how many links were found from each engine.

V. Have students go to the following site and follow along as the instructor writes important search strategies on the board.

(<http://home.sprintmail.com/~debflanagan/main.html>)

VI. Have students practice the steps of the online tutorial after each introduction by the instructor

VII. After all concepts have been written on the board and students have taken their last tutorial, have students start a new word processing file, label it "Search Engine tips" and copy the information from the board.

VIII. Have students print this information and keep it in a folder for future reference.

Materials:

Computers, Internet access, white board, word processing program

Assessment:

Students will be given a grade for following along and creating the text document.

Follow-Up:

An oral or written pop quiz could be given with different search topics and the student would answer with the best procedures to follow for gaining the best search results.

Lesson Plan Three

Title:

Creating a glossary of Internet Terminology so that students have a hard copy of useful vocabulary words.

Description:

This lesson will help teach the students some unfamiliar terms associated with the Internet.

Goal:

Students will create a glossary of Internet terms that they can use and hopefully memorize to help them communicate effectively about the Internet (see sample, APPENDIX B).

Objectives:

Students will create a glossary of at least 50 Internet terms.

Students will use a word processor to help them create this list of terms.

Students will use the Internet to research and locate these terms.

Students will save this glossary file and have it accessible to add new terms as they arise.

Students will print and add this to the other resources they have created for future reference.

Background:

The Internet is loaded with terms and words that didn't exist fifteen years ago. Most of these terms are not familiar ones with the general public. Students may know some of the terms that they find, but typically speaking, they won't know all. Increasing student's technical vocabulary is important for the advancement of those students in the Internet field.

Procedures:

- I. Introduce Concepts
- II. Have students log onto the Internet
- III. Have student's research and find words and terms related to the Internet.
- IV. Students should write these terms down along with the definitions
- V. Students will collect at least 50 terms and their definitions
- VI. Students will create a word processing file entitled "Technical Vocabulary"
- VII. Students will type all 50 terms and definitions into this file.
- VIII. Students will put terms into alphabetical order.

IX. Students will save the file and print the file and add it to the growing list of material for future reference.

Materials:

Computers, Internet access, word processor, printer

Assessment:

Students will receive a grade for completing the assignment

Follow-Up:

Students could be given an oral or written pop quiz with any of the terms that the instructor deems relevant for that day's lesson.

Lesson Plan Four

Title:

Evaluating and Critiquing Web Pages for the beneficial use of students who will be creating pages of their own.

Description:

This lesson will enable students to evaluate and critique their own web page as well as other's pages.

Goal:

Students will use the evaluation process to reevaluate and enhance their own web pages designs.

Objectives:

Students will learn to evaluate other people's web sites.

Students will learn to determine what is correct and what is incorrect about the designs of other web pages.

Students will use the information gained with the critiquing process to make their sites better through the mistakes of others.

Students will learn the proper use of text colors and background colors.

Students will learn the proper use of pictures and illustrations.

Students will learn the proper layout of specific web pages.

Background:

Evaluating other people's web sites plays a crucial role in learning proper web page design. When a web page is critiqued, the images, texts, layout and information are discussed to determine if they serve a purpose. Every aspect of a web page must have a purpose or else it's just wasted file space. Everyone knows that wasted file space means larger files, and larger files mean slower loading times for the page. Pages need to load as easily and quickly as possible if they want to keep a person interested in their site.

Procedures:

- I. Introduce Concepts of Evaluating web pages.
- II. Students should log onto the Internet and look up three of their favorite sites.
- III. Students should use the Evaluation hand out that is provided and answer the questions about their three sites (see APPENDIX C).
- IV. Students should use one Evaluation form for each site.
- V. The instructor should go over the questions on the Evaluation form and make sure that each student understands the questions and what to look for on the web site.
- VI. Students and teachers should discuss the grades that were given to each site and as a class determine if the grade was fair. Use the teacher's computer and projector to show key concepts from a site to the entire class.
- VII. Give each students a few extra Evaluation forms that they can put into their folder for future use when they evaluate other school web pages and when they critique other classmate's web pages.

Materials:

Computers, Internet access, Evaluation Forms, Projector connected to teacher computer.

Assessment:

Students will be graded on the three Evaluation forms that will be handed in to the instructor.

Follow-Up:

Students will be doing future critiques of other sites so it will be necessary for students to keep a few evaluation forms in their folders. Before students start creating personal web pages and the school web site, it will be required to evaluate similar sites.

Lesson Plan Five

Title:

Storyboard and Flow Chart Creation to help students visualize their web sites before creation is complete.

Description:

This lesson will teach students how to create a web site with a pencil and paper before putting it onto a computer or the Internet.

Goal:

Students will use storyboards and flow charts to determine the layout of each page and the size and shape of their overall web site.

Objectives:

Students will use storyboards to help them create well thought out pages.

Students will use flow charts to help them determine the size and shape of the overall web site.

Background:

It is important to have a visual guide to work with when starting to create a web site. Just like a builder needs a set of blue prints to build a house, a web page designer needs a storyboard to create a web site. Without a storyboard, a designer is leaving his creation to chance. However, with the storyboard, a designer saves time and effort and knows exactly what needs to be created and when. The flow chart is used to show the hierarchy of a site. Creating a flow chart is essential to determine which pages are linked to which sites. Without a flow chart, a designer could become confused about the sites links.

Procedures:

- I. Introduce concepts of storyboards and flow charts
- II. Storyboard sheets should be handed out so that every student has at least two sheets (see APPENDIX D).
- III. Show students how to create a detailed, yet rough storyboard on the board.

IV. Students should determine how many pages are going to be needed for their section of the overall web site.

V. Students will follow the instructor's examples and create storyboards for all of the pages that they will be creating.

VI. After all the storyboards have been created, a flow chart should be drawn to determine how pages are linked together.

Materials:

Storyboard sheets, blank paper for flow charts, pencils NOT pens, white board

Assessment:

Students will be graded on the creation of their storyboards and on the creation of their flow chart.

Instructor should check that all pages are consistent with each other and with the overall design of the entire web site.

Follow-Up:

Before the pages are created on the computer, they will need to be reevaluated to make sure that the style is consistent with the original design concept. After the pages are created on the computer they will be evaluated again before publishing.

Lesson Plan Six

Title:

Interviewing Subjects for Web Page Information so students have a complete list of information to build a web page with.

Description:

This lesson will enable students to conduct a meaningful informative interview.

Goal:

Students will interview staff members, administration, coaches and other students to gain information for the school web site that they will be creating

Objectives:

Students will conduct informative interviews with members from the school and community.

Students will take good notes that they can use on their web page creations.

Students will gain a broader understanding of the different departments in the school.

Students will build an alliance with other staff members, administration, coaches and other students.

Students will complete an interview guide sheet with pertinent questions pertaining to their web page (see APPENDIX E).

Background:

Students will be spending a majority of this class working on the creation of a school web site. On this web site there are many different departments, clubs, sports and other sections that will need to be created. The only way to gain information on these areas is to conduct interviews with people who are a part of them. Therefore it is very important to learn to conduct meaningful and informative interviews that will help the students gain the needed information to make the site useful for its viewers.

Procedures:

- I. Before introducing this lesson, write a note addressed to all staff members informing them that your students will be setting up interview times with some of them for information about their department, club, sport, etc. Explain that it will be used for the School web site that the class is creating.
- II. Introduce concepts of interviewing
- III. Hand out copies of the Interview guide sheet to each student
- IV. Conduct a mock interview with a volunteer student.
- V. Let students practice interviewing each other.
- VI. Let students make contact with their interviewee and setup an interview time and date.

VII. When interview is scheduled, make sure students use their Interview guide sheets as a reference for making the interview go smoothly.

Materials:

Students will be using the Interview guide sheets for this exercise (see APPENDIX E).

Assessment:

Students will be graded on the information that they receive from the interview process. Students need to make sure that they get the needed information so they don't need to make other unnecessary contacts.

Follow-Up:

The students will actually be doing the follow-up work on this assignment. As time passes and the web site changes, update interviews will need to be conducted to keep the students and the web site up-to-date with its information.

Lesson Plan Seven

Title:

Designing Personal Web Pages using student information will give students good practice for creating meaningful pages.

Description:

This lesson will enable students to use any authoring tool to design a personal web page

Goal:

Students will use any authoring tool to create and design a personalized original web page.

Objectives:

Students will create a personal web page

Students will use a wizard to create this first web page

Students will format their page by adding background color, text color, etc.

Students will add links to at least 2 other web sites

Students will insert pictures, graphics, or audio clips from other web sites or from the wizard's art files.

Students will personalize the page to show readers what the creator's interests/hobbies are.

Background:

Web page designing is one of the new innovative skills that the world of technology is requiring. Students will be able to use this information to form a career or to boost an existing career. This particular assignment is giving the students the opportunity to express their personal interests while learning a valuable skill. This assignment will give students an insight into the career of web page designing.

Procedures:

- I. Introduce concepts
- II. Introduce the authoring tool chosen to do this assignment
- III. Take students through the wizard showing them the basics of putting together a web site that contains the assigned features.
- IV. Show students how to save their work

Materials:

Computers, projector connect to teacher computer, Internet access, web page authoring software

Assessment:

Students will be graded on their web page and how well they followed instructions.

Follow-Up:

At this point the student pages will not be published onto the web. However, they will later on in the class. All web pages will be evaluated by the instructor before they are published. They will be published as part of the school web site when it is being created.

Lesson Plan Eight

Title:

The designing of a school site Web Page will give each student the opportunity to use their newly acquired skills.

Description:

This lesson will enable students to use any authoring tool to design a school web site.

Goal:

Students will use any authoring tool to create and design a school web site.

Objectives:

Students will create several school web pages.

Students will use a previously agreed upon design as a format and create a school web site.

Students will format their pages by adding background color, text color, etc.

Students will add links as necessary to other web sites and to other pages within this school site.

Students will insert pictures, graphics, or audio clips that will help portray the department, club or sport that they are working on.

Students will add a link to their previously created personal web page to show readers what the creator's interests/hobbies are.

Students will use previously learned information such as copyrighting, using proper techniques, interviewing, and storyboarding to create the best possible web pages.

Background:

Web page designing is one of the new innovative skills that the world of technology is requiring. Students will be able to use this information to form a career or to boost an existing career. This particular assignment is giving the students the opportunity to express their personal interests while learning a valuable skill. This assignment will give students an insight into the career of web page designing.

Procedures:

- I. Introduce concepts
- II. Introduce the authoring tool chosen to do this assignment
- III. Take students through the format that was decided on for all school web pages and create a template that they can use to insert information.
- IV. Show students how to save their work
- V. Show students how to add pictures and graphics from a digital camera or from a scanner.
- VI. Have students integrate their information from all interviews into their web page.
- VII. Make sure students follow all copyright laws by reviewing some of the key issues.

Materials:

Computers, projector connect to teacher computer, Internet access, web page authoring software, digital camera, scanner, previous text documents

Assessment:

Students will make evaluations of their created web pages before submitting them to the instructor. Students will be graded on their web page and how well they followed instructions.

Follow-Up:

All web pages will not be published onto the web until they have been critiqued and revised by the class and then evaluated by the instructor. Once the design has been approved by the class and by the instructor, it will be submitted to the network administrator for publishing onto the web.

APPENDIX A
ACCEPTABLE USE POLICY (AUP) SAMPLE

ACCEPTABLE USE POLICY (AUP) SAMPLE

Adapted from Dyrli, 1996a

Internet - Terms and Conditions

PLEASE READ THE FOLLOWING BEFORE SIGNING THE CONSENT FORM.

1. Acceptable Use - The purpose of accessing the Internet is to support research and education in and among academic institutions in the United States by providing access to unique resources and the opportunity for collaborative work. All use of the Internet must be in support of education and research and consistent with the educational objectives of Chesapeake Public Schools.

2. Privileges - Each student/staff member accessing the Internet will be trained on the proper uses of the Internet. Use of the Internet is a privilege and inappropriate use will result in a cancellation of those privileges.

3. Netiquette - Students/staff members accessing the Internet will follow the generally accepted rules of network etiquette. These include, but are not limited to, the following:

- a. Be polite.
- b. Use appropriate language. Do not swear, use vulgarities, or any other inappropriate language.
- c. Remember that illegal activities are strictly forbidden.
- d. Do not reveal your personal address or phone number or the personal addresses or phone numbers of others.

- e. Note that electronic mail (e-mail) is not guaranteed to be private. People who operate the system have access to all mail. Messages relating to or in support of illegal activities will be reported to the authorities.

4. Security- Security on any computer system is a high priority, especially when the system

involves many users. If you feel you can identify a security problem, you must notify your teacher or the school principal. Do not demonstrate the problem to other users. Attempts to access the Internet without permission will result in cancellation of user privileges. Any user identified as a security risk or as having a history of problems with other computer systems may be denied access to the computer lab network or Internet.

I understand and will abide by the Internet Terms and Conditions. I understand that any violation of the regulations is unethical and may constitute a criminal offense. If I commit any violation, my access privileges may be revoked and school disciplinary action and/or appropriate legal action may be taken.

Student User's

Signature: _____

Date _____ / _____ / _____

PARENT OR GUARDIAN (If the student is under the age of 18, a parent or guardian must also read and sign this agreement.)

As the parent or guardian of (Student's Name) _____,

I have read the Internet Terms and Conditions. I understand that this access is designed for educational purposes and that Chesapeake Public Schools has taken available precautions to eliminate controversial material. I also recognize, however, that it is impossible for Chesapeake Public Schools to restrict access to all controversial materials, and I will not hold the school division responsible for materials acquired on the network. Further, I accept full responsibility for supervision of my child when my child's use of the Internet is not in a school setting. I hereby give permission for (Student's Name) _____ to access the Internet.

Parent or Guardian (please print): _____

Signature: _____ Date: _____

_____/_____/_____

(PLEASE RETURN TO YOUR STUDENT'S SCHOOL.)

TELECOMMUNICATION ACCEPTABLE USE PROCEDURES

Applicability

These procedures shall apply to all users (e.g. students, teachers and administrators) of telecommunications systems which are entered via equipment and access lines located in Chesapeake Public Schools or to all users who obtain their access privileges through association with the school division.

Purpose

The purpose of these procedures is to ensure school-level compliance with procedures and guidelines concerning all telecommunication activities, specifically Internet, which may be generated at local, state, national and international levels.

Training and Compliance

All students and staff will be trained in and will comply with all policies and guidelines adopted by Chesapeake Public Schools for the accessing of telecommunications. All such users will be trained in "Netiquette", electronic communication ethics, and user responsibilities.

Copyrighted material

In order to protect intellectual property rights and the continued availability of network access, computer software which is protected under the copyright laws will not be

transmitted via the network or stored on any school computers without the express written permission of the copyright owner.

Consequences of Inappropriate Network Behavior

Repeated or severe infractions of the procedures and guidelines may result in termination of access privileges. Student infractions may result in appropriate disciplinary action in addition to suspension or termination of access privileges. Unauthorized use of the network, intentional deletion or damage to files and data belonging to other users, or copyright violations may be termed theft.

Internet - Acceptable Use

The purpose of accessing the Internet is to support research and education in and among academic institutions in the United States by providing access to unique resources and the opportunity for collaborative work. Use must be in support of education and research and consistent with the educational objectives of Chesapeake Public Schools. Specific guidelines shall be as follows:

1. All use of the Internet must be in support of education and research and consistent with the purposes of Chesapeake Public Schools.
2. Use of other organization's network or computing resources must comply with the rules appropriate for that network.

3. Transmission of any material in violation of any federal or state regulation is prohibited.

This includes, but is not limited to transmission of copyrighted material, threatening or obscene material, or material protected by trade secret.

4. Use of the network for commercial or for-profit purposes is prohibited.

5. Use of the network for personal and private business is prohibited.

6. Use of the network for product advertisement or political lobbying is prohibited.

7. Network accounts are to be used only by the authorized owner of the account for the authorized purpose.

8. Users shall not intentionally seek information on, obtain copies of, or modify files, other data, or passwords belonging to other users, or misrepresent other users on the network.

9. All communications and information accessible via the network should be assumed to be private property.

10. No use of the network shall serve to disrupt the use of the network by others
hardware or software shall not be destroyed, modified, or abused in any way.

11. Malicious use of the network such as developing programs that harass other users, infiltrating a computer or computing system, or damaging the software components of a computer or computing system is prohibited.

12. Hate mail, harassment, discriminatory remarks, and other antisocial behaviors are prohibited on the network.

13. The illegal installation of copyrighted software for use on district computers is prohibited.

14. Use of the network to access or process pornographic material, inappropriate text files, or files dangerous to the integrity of the local area network is prohibited.

15. Chesapeake Public Schools maintains the right to determine whether specific uses of the network are consistent with acceptable practices.

16. Personal information regarding users may not be provided across the Internet (e.g., last name, pictures, address, or telephone numbers).
(sample AUP from <http://www.ash.udel.edu/ash/teacher/AUP.html>)

APPENDIX B

GLOSSARY

GLOSSARY

Address: The location of an Internet resource. An email address may take the form of joeschmoe@somecompany.com. A web address looks something like <http://www.squareonetech.com>.

ASCII: American Standard Code for Information Interchange. A set of 128 alphanumeric and special control characters. ASCII files are also known as plain text files.

BPS: Bits Per Second - a measurement of the volume of data that a modem is capable of transmitting. Typical modem speeds today are 14.4Kbps (14,400 bits per second) and 28.8Kbps. ISDN offers transfer rates of 128Kbps.

Bookmark: A pointer to a particular Web site. Within browsers, you can bookmark interesting pages so you can return to them easily.

Browser: A program run on a client computer for viewing World Wide Web pages. Examples include Netscape, Microsoft's Internet Explorer and Mosaic.

Dial-up Connection: A connection to the Internet via phone and modem. Connection types include PPP and SLIP.

Direct Connection: A connection made directly to the Internet - much faster than a dial-up connection.

Discussion Group: A particular section within the USENET system typically, though not always, dedicated to a particular subject of interest. Also known as a newsgroup.

Domain: The Internet is divided into smaller sets known as domains, including .com (business), .gov (government), .edu (educational) and others.

Domain Name: Allows you to reference Internet sites without knowing the true numerical address.

Download: The process of copying data file(s) from a remote computer to a local computer. The opposite action is “upload” where a local file is copied to a server.

E-mail: Electronic mail.

Flame: An insulting message exchanged via email or within newsgroups. A series of flames are known as *flame wars*.

FreeWare: Software that is available for download and unlimited use without charge. Compare to shareware.

FTP: File Transfer Protocol - a set of rules for exchanging files between computers via the Internet.

Gopher: A system allowing users to search for files via menus or directory structures. Uses plain English names and is text based only.

Home Page: The first page of a Web Site. Also, the Web site that automatically loads each time you launch your browser.

HTML: HyperText Markup Language - a collection of tags typically used in the development of Web pages.

HTTP: Hypertext Transfer Protocol - a set of instructions for communication between a server and a World Wide Web client.

Hyperlink: A connection between two anchors. Clicking on one anchor will take you to the linked anchor. Can be within the same document/page or two totally different documents.

Hypertext: A document that contains links to other documents, commonly seen in Web pages and help files.

ISP: Internet Service Provider - the company which provides you with a connection to the Internet via either a Dial-up Connection or a Direct Connection.

IP Address: Internet Protocol Address - every computer on the Internet has a unique identifying number, like 191.1.24.2.

Internet: The worldwide network of computers communicating via an agreed upon set of Internet protocol. Odds are that if you are reading this document, you are probably on the Internet right now (just in case you didn't know).

LAN: Local Area Network - a network of computers confined within a small area, such as an office building.

Link: Another name for a hyperlink.

Microsoft: C'mon, everybody has heard of Microsoft! Home of Bill Gates. The world's largest operating system and application software development company. Products include Windows 95, the MS Office Suite, the MS Internet Explorer, and far too many others to list here.

Mosaic: One of the first graphical World Wide Web browsers developed at NCSA.

Multimedia: A combination of media types on a single document, including: text, graphics, animation, audio and video.

Netiquette: Emily Post meets the Internet. Short for Internet etiquette.

NCSA: National Center for Supercomputing Applications - an organization headquartered at the University of Illinois. Researchers here created the Mosaic and HTTPD server programs.

Network: A system of connected computers exchanging information with each other. A LAN is a relatively smaller form of a network in comparison to the Internet, a world wide network of computers.

Online: When you connect to the Internet, you are *online*.

Online Service: Services such as America Online, CompuServe, Prodigy and the Microsoft Network which provide content to subscribers and usually connections to the Internet, though sometimes limited. For instance, online services just recently added Web browsing ability. If you spend a lot of time on the Internet, the fees these services charge add up rapidly.

Page: An HTML document, or Web site.

Provider: An Internet Service Provider, or ISP.

Search Engine: A tool for searching information on the Internet by topic. Popular engines include InfoSeek, Excite and Web Crawler.

Server: One half of the client-server protocol runs on a networked computer and responds to requests submitted by the client. Your World Wide Web browser is a client of a World Wide Web server.

Shareware: Software that is available on a free limited trial basis. Sometimes this is a fully featured product, other times it lacks some of the features of the commercial version.

If you find the product useful, you are expected to register the software, for which in return you will receive the full featured commercial version.

Site: A single or collection of related Web pages.

URL: Uniform Resource Locator - the method by which Internet sites are addressed. An example would be "http://www.squareone.com", the address of the home page.

WAN: Wide Area Network - a system of connected computers spanning a large geographical area.

WWW: World Wide Web, or simply Web. A subset of the Internet which uses a combination of text, graphics, audio and video (multimedia) to provide information on most every subject imaginable.

(Definitions from <http://www.squareonetech.com/glosaryf.html>)

APPENDIX C
WEB PAGE EVALUATION SHEET

Web Page Evaluation Sheet

EVALUATOR: _____ SCHOOL: _____

URL: _____

First Impression:	
Quickly understand location, mailing Address, update info?	
How many seconds, minutes to load?	
Any animation, graphics, or special text? Describe.	
How many links available within the school web page? List. (use back if needed)	
Any external links? List.	
Describe use of photos, size, and type.	
Describe technique to connect to links, i.e., Icon based, buttons, active text?	
Size of screen information, use of scroll bar, Describe.	
Table of Contents, Menu, Easy to use? Describe.	
Graphically appealing? Why? Why not?	
Text easy to read? Why? Why not?	
Color combinations used throughout? Was a template used? Describe.	
What software was used? Any service Or version recommendation?	
Any copyright notices? Any needed?	
Any reference to who designed the web page? Individual(s), Class, Club?	
Name two significant parts of this web page You would like to see in yours/ours.	
General Comments:	
Rate this web page overall using our grading Scale: A B C D F in consideration of all of The above. Why?	

Created by Jody Oliver, 1999

APPENDIX D
MULTIMEDIA STORYBOARD

Multimedia Storyboard

Project:

Date: _____

Screen: ____ of ____

Links from screens:

Links to screens:

Screen description: _____

Functionality/interactivity:

Background:

Audio:

Color schemes:

Video:

Text attributes:

Stills:

APPENDIX E
INTERVIEW GUIDE

Interview Guide

Web Designer:

1. Name of Contact:	
2. Describe purpose and goal of Department, Club Or Activity	
3. Brief bio of Contact person: Position, experience, alma matter, personal and/or interests/hobbies	
4. List other members involved in this area: Staff, students, community. Ask if this will require Additional interviews or will main contact handle?	
5. After presenting your ideas for web page, what suggestions do they have: display, photos, student projects, information, weekly updates, etc.	
6. Do they have any info, photos, or student projects from last year we can include? Make a reminder list for Follow-up.	
7. Date for follow-up meeting	
8. Remind main contact person that all drafts of this section will be approved prior to publishing the web by them, and by your teacher. If they have any questions, they can contact you during your web page design class.	

Created by Jody Oliver, 2000

REFERENCES

- Astleitner, Hermann, Leutner, Detlev. (2000). Designing Instructional Technology from an Emotional Perspective. *Journal of Research on Computing in Education*, 32(4), 497-511.
- BBN Timeline: The 1960s. (2001). Retrieved May 23, 2002. from <http://www.bbn.com/timeline/60.html>.
- Burch, Hal, Cheswick, Bill. (1999). Mapping the Internet. *Computer*, 32, 97-99.
- California Department of Education. (2000). *Industrial and Technology Education: Academic and Career Integration*. Retrieved May 23, 2002. <http://www.cde.ca.gov/shsd/aci/ite.html>
- Cohen, Vicki, L. (2001). Learning Styles and Technology in a Ninth-Grade High School Population. *Journal of Research on Computing in Education*, 33(4), 355-367.
- Day, K., Schrum, L. (1995). The Internet and acceptable use policies: What schools need to know. *The ERIC Review*, 4(1), 9-11.
- Doherty, Andrew. (1998). The Internet: Destined to become a Passive Surfing Technology? *Educational Technology*, 38, 61-63.
- Dyrli, Odvard Egil. (1996a). Does Your School Have an Acceptable Use Policy? *Technology and Learning*, 16, 18.
- Dyrli, Odvard Egil. (1996b). Technology Planning with Online Resources. *Technology and Learning*, 16, 16.
- Dyrli, Odvard Egil. (1995a). E-mail Bridges to School Collaboration. *Technology and Learning*, 16, 26.
- Dyrli, Odvard Egil. (1995b). Surfing the World Wide Web to Educations Hot-Spots. *Technology and Learning*, 16, 36-40.
- Dyrli, Odvard Egil, Kinnaman, Daniel E. (1996a). Teaching Effectively with Telecommunications. *Technology and Learning*, 16, 57-62.

- Dyrli, Odvard Egil, Kinnaman, Daniel E. (1996b). Energizing the Classroom Curriculum through Telecommunications. *Technology and Learning*, 16, 65-71.
- Dyrli, Odvard Egil, Kinnaman, Daniel E. (1995). Telecommunications: Gaining Access to the World. *Technology and Learning*, 16, 79-84.
- Eager, B. (1994). Using the World Wide Web. Indianapolis: Que Publishing.
- E-Commerce boosts Revenue, Jobs, Study Reveals. (1999, June 12). *The Washington Times*, p. A1.
- Curriculum Design and Development. (1999). *Explaining Learning Outcomes*. Retrieved May 23, 2002. from <http://webnz.com/wnp/online/bedu6204/public/204intro.htm>
- Flowers, Beverly F., Rakes, Glenda C. (2000). Analysis of Acceptable Use Policies Regarding the Internet in Selected K-12 Schools. *Journal of Research on Computing in Education*, 32(3), 351-366.
- Garfinkel, Simson. (2000b). Database Nation: The Death of Privacy in the 21st Century. O'Reilly and Associates, 168-169.
- Garfinkel, Simson. (2000a). Database Nation: The Death of Privacy in the 21st Century. O'Reilly and Associates, 27-29
- Gates, Bill. (2000). Shaping the Internet Age. *Internet Policy*. Retrieved August 20, 2001. From <http://www.internetpolicy.org/briefing/current.html>
- High School high Rollers of the Web Age. (2001, July 2). *The Washington Times*, p. A12.
- Hill, Roger B. (1996). Using Web Pages to Teach Communication Systems. *The Technology Teacher*, 56, 22-26.
- Jonassen, David H. (1988). *Instructional Design for Microcomputer Courseware*. New Jersey: Lawrence Erlbaum Associates, Publishers. 132, 133.

- Jonassen, David H., Beissner, Katherine, Yacci, Michael. (1993). *Structural Knowledge: Techniques for Representing, Conveying, and Acquiring Structural Knowledge*. New Jersey: Lawrence Erlbaum Associates, Publishers. 140.
- Jonassen, David H., Grabinger, R. Scott, Wilson, Bret W. (1990). *Building Expert Systems in Training and Education*. New York: Praeger, Publishing. 50.
- Jupiter Communications. (1999). *Proactive Online Privacy: Scripting an information Dialog to Alloy Consumers fears*. Retrieved August 20, 2001 from
- Kinnaman, Daniel E. (1995). Leap Frog is not an Olympic Sport. *Technology and Learning*, 16, 60.
- Lachs, Vivi, William, Dylan. (1998). Making the Computer Dance to Your Tune: Primary School Pupils Authoring Hypermedia. *Journal of Computing in Childhood Education*, 9(1), 57-77.
- Lehrer, R., Erickson, J., Connell, T. (1994). Learning by Designing Hypermedia Documents. *Computers in the Schools*, 10, 1-2.
- Lemay, L. (1995). *Teach yourself Web Publishing with HTML in a Week*. Indianapolis: Sams Publishing. 45-44.
- Lynch, and Horton. (1997). Tips for Designing Web Sites. Retrieved August 19, 2001. from http://info.med.yale.edu/caim/manual/pages/graphic_design100.html
- Maddux, Cleborne D. (1998). The World Wide Web: Some Simple Solutions to Common Design Problems. *Educational Technology*, 38, 24-28.
- McKenzie, Jamie. (1996). Keeping it Legal: Questions Arising out of Web Site Management. *From Now On*. Retrieved August 20, 2001. from <http://fno.org/jun96/legal.html>
- McKenzie, Jamie. (1997). Why in the World Wide Web. *From Now On*. Retrieved August 20, 2001. from <http://www.fno.org/mar97/why.html>

- Milheim, William D., Harvey, Douglas M. (1998). Design and Development of a WWW Resource Site. *Educational Technology*, 38, 53-56.
- Oliver, Jody. (1999). Web Page Evaluation Sheet. Silverado High School.
- Oliver, Jody. (2000). Interview Guide. Silverado High School.
- Papert, Seymour. (1980). *Mindstorms: Children, Computers, and Powerful Ideas*. New York: Basic Books, Inc. 21.
- Presno, Caroline. (1998). Taking the Byte out of Internet Anxiety. *Journal of Educational Computing Research*, 18, 147-161.
- Rice, Condolecza. (1998). *Copyright and Fair Use*. Retrieved August 19, 2001 from <http://fairuse.stanford.edu/rice.html>
- Rosenblad, Ken, Shepard, Steven D. (1999). The Web can be Suitable for Learning. *Computer*, 32, 114-115.
- Sholtz, Paul. (2000). Economics of Personal Information Exchange. *First Monday* Retrieved August 20, 2001. from http://www.firstmonday.dk/issues/issue5_9/sholtz/
- Snow, Andrew P. (1999). Internet Implications of Telephone Access. *Computer*, 32, 108-111.
- Turau, Volker. (1998). What Practices are being Adopted on the Web. *Computer*, 31, 106-108.
- Varzavand, Shahram, Egger, Stephan, Lyle, Stanley P. (1998). Getting Started on the Web. *Journal of Industrial Technology*, 14(3), 31-34.
- Wagner, Paul Douglas, Wagner, Thomas A. (1997). World Wide Web in the Classroom. *The Technology Teacher*, 56, 22-25.