Project Overview:

The title of my project is "Using Digital Media to Teach Computer Literacy." Ever since I first started working with computers, I have felt that it was important to have a basic understanding of how the computer works in order to get the most out of it. I was never afraid to solve technical problems on my own, to open the computer up and poke around, or to experiment with the computer's capabilities. I received my undergraduate degree in computer science, and as a result I learned about all the intricacies of the computer, both its hardware and its software. This knowledge gave me an even greater appreciation for the massive amount of time and brain-power that went into the evolution of the modern computer: an extremely complex series of electronics and circuits masked under a system of simplicity and intuition.

My concern over the fact that the mask of simplicity was doing too good a job of obscuring the computer's true complexity was in my first-year Master's class, "Critical Approaches to Digital media. One of the required readings for that class was an essay by Chris Chesher entitled "Why the Digital Computer is Dead." In that article, he argued that the computer should be renamed "invocational media" because the digital and computative qualities of the computer are no longer important to its users. He said that since most people use their personal computers for viewing, listening to, and interacting with different forms of media, that the machine needs to have a name more in line with people's expectations for it, and he wanted to discard the term "digital computer" simply because the personal computers we use every day no longer exhibit the same qualities of early digital computers, which gained the name as a result of the fact that they stored all data in binary numeric form (the term "digital" as it relates to computers means something expressed in numeric form), and that their primary function was as a computation device for mathematical data.

This was a position that I had to strongly disagree with. It took many layers of computer languages to even give the computer a visual interface, and even more to bring us the sleek, visually appealing programs we have today, but we cannot discard the term "computer" just yet, because at its most basic level, the digital computer is still the same machine, still making mathematical computations and still sending and receiving data as a series of ones and zeros. I believe that if we forget that the computer is just a tool programmed with information by human beings, then we may start ascribing power and personality to a device that we created, and at that point we no longer have control over the technology, it has control over us.

I see the problems with a lack of understanding of the basic mechanical nature of computers being played out in two ways within our society, through fear and complacency. When a person is overly fearful of technology, he is more likely to erect strong and unnecessary barriers to its use and advancement without considering the benefits that such advancement can bring to society. Fear of technology also leads to fear of users of technology, as we can see in overarching assumptions by people of older generations that the Internet, video games, cell phones, and other modern technologies will cause young people to develop self-centered, anti-social, or criminal behaviors. On the flip side, there are many people out there for whom a lack of understanding about how computers work has lead to a sense of complacency concerning their widespread use and infiltration into everyday life. The complacent individual is one like Chesher, who wants to redefine computers by the way they are used by a certain group of people, forgetting that the digital computer he thinks no longer exists is still alive and well in our government databases, our scientific laboratories, our household appliances, our cars, and any other piece of modern technology that has a digital component to it. The complacent individual uses a computer without realizing the effect that it has on their everyday life; they make no stand on computer issues, they do not concern themselves with computer privacy, they have no say on the wisdom of using RFID chips in passports, or government snooping into their emails because they do not see how it affects them. They stand on the opposite side of the fence from the overly fearful, questioning nothing about technology rather than questioning everything. Obviously, a healthy medium lies somewhere in the middle, but the only way to bridge the gap is through an increase in computer

literacy, an increase in the overall social understanding of computers and how they function. And the first way to increase society's knowledge of a piece of technology is to make that information readily and easily accessible to anyone looking to learn.

Project Contexts:

In order to create an interactive media project that would be effective in educating people about the inner workings of a computer, I researched the current means and methods of education through interactive media. I found that though methods of teaching and learning styles have been closely studied in regards to the traditional classroom setting, alternative teaching styles through media have often come and gone as fads, and therefore have not been rigorously studied. The majority of studies on teaching with media were done in regards to instructional videos and educational television programs for children, and the primary observation has been that the failing of such learning experiences is that watching a television is a principly passive activity. The student does not interact with the program in any meaningful way, and there is no reinforcement or feedback to ensure that the student understands the concepts being presented to him. Though an interactive computer program would solve many of the failings of televised learning experiences, the technology has been deemed too new, and the institution of traditional learning too well-tested for computer-based education to have progressed very far or studied in any real depth.

The one area in which computer-based learning is being tested, however, is in the field of adult distance education. There are numerous online colleges and degree programs that help adults receive or finish degrees online so that they can better fit their studies into their busy work lives, without having to travel to a school or take classes only on weekends or late at night. These degree programs still take the basic approach of a traditional educational framework, where the teacher gives lectures and posts assignments, and the students ask questions, take tests, and turn in assignments, but it is all done online through specially-designed interfaces that allow students and teachers to chat online, collaborate on assignments through file-sharing systems, and lectures to be given in either an audio or a text format that the student can read or play back at her leisure and based on whether she learns better by reading the notes or listening to them.

This project is designed as a single online “lesson,” as it were, and not as a course on computer literacy, so there is no student-teacher feedback through the media interface. However, by focusing on the fact that many adults, at whom this project is targeted, already look to the Internet when they want to enhance their understanding in a specific field of study, and using the knowledge that adults have a much better grasp of what they want to learn when they go searching for information, I designed a media program that enhances its ability to teach by tapping into the self-directed nature of adult learning. I designed a program that people could work through at their own pace, with several levels of information so that the users could choose how much information about each computer component they want to know. I also designed not just one, but several different ways of getting the information. There is an interactive Flash portion, a video walkthrough, and a text-based reference guide that all give the user the same information. This makes the information almost universally accessible – if a user doesn't have a computer with Flash capabilities, or if they have a slow Internet connection, they can still access the information through other means. The variety of ways for accessing the information about computers also means that it has the ability to become a repeat resource for information. A user that views the video in order to get the basic information may come back later to refresh their knowledge through the interactive Flash walkthrough, or may come to read the text-based resource on order to get advanced information when they are planning on upgrading or purchasing a new computer.

Before I give you my self-assessment of the project, I would like to show you the video portion of it, so that you can get an idea of the project layout and the information that is imparted through it.

Project Self-Assessment:

In designing this project, I wanted to make the three-dimensional model of the computer as realistic as possible without tying it to any specific brand or model of computer. It was designed to be a Windows PC, rather than an Apple or a laptop computer because the majority of computer users are Windows PC users. In my initial proposal, I had planned to have a section of the walkthrough for Apple users and laptop users, that would highlight the differences in components or design of their computers because I, like many other computer users, had assumed that there was more of a difference between computers than there actually are. As I did my research, I found that there are no longer any real differences between Apple PCs and Windows PCs any more. They use the exact same hardware, the exact same processors, and generally share many of the same components. The specifications on their components all mean the exact same things, and the only driving difference between them is the operating system and the programs that can be run on each one. Therefore, when looking at a computer's hardware, you can compare Windows and Apple computers directly, as there are no substantial differences between them any more.

Additionally, when looking at the differences between desktop and laptop computers, the only real differences are in power and size. They still have all the same components – motherboards, CPUs, RAM, hard drives, disk drives, etc. - that are all specifically designed for laptops. This means that they are not as powerful as desktop components and are sized to fit inside a laptop (which contributes to the difference in power as well), but they use the same specification terminology to describe their components' power ratings. As a result, I decided that I did not need any special information about Apple computers or laptops other than to tell the users who may not know that their Apple computers or laptops are more similar to a Windows desktop PC than they may have previously imagined.

Another change that I made to the project from my initial proposal was the removal of the introductory and ending questionnaires that I had initially believed would assist the user of the walkthrough in deciding what they wanted to view and would help reinforce their knowledge retention after they had learned what they wanted to know. I had planned to collect the results of the surveys that asked people what they learned from their use of the interactive program for increasing my understanding of the usefulness of interactive programs such as this in imparting educational information. This information would then be useful in future personal projects and in continuing to make this interactive program a useful resource for teaching people about computers. As I worked through the design and did research for the information about the computer components online, I realized that an easy-to-use reference for computer hardware, complete with three-dimensional photos and a minimum of non-technical language, was not easily accessible over the web. This changed the scope of my project from a simple educational tool to a (hopefully) well-used resource for computer hardware information, and I decided that if I wanted people to use the site frequently and in many different ways in order to get basic computer hardware information, having to fill out or skip over a form every time they visited would discourage them from using the site in the way that I now intended. So I abandoned the plan to gather information on the site users' experiences, for now.

Aside from these small changes to my proposal, everything about the design went as planned. I used the components from an older computer, which allowed me to model components that would be found in most people's computers while providing descriptions of new technologies that may be found in more recent computers. All the three-dimensional elements of the computer were modeled out of this design, and skinned using photographs taking of each component. I divided the animation up into sections so that each component could be viewed separately when imported into the Flash presentation, and I designed the Flash project so that elements could be viewed in any order. I also separated out the text-heavy additional information into a separate part of the project that users could access if they wanted to, but so that it would not detract from the straightforward basic explanation of each component. The video is a straightforward, narrated version of the interactive project, with each

element being presented in a certain order and each part of it illustrated with basic information while the explanation is given in the audio narration. The text-based walkthrough is also a rehashing of the same information, but in a tree-structure format that is faster to click through than the interactive portion because it contains no animations to sit through between explanations.

The only thing about this project that I would have done differently is allowing for more transitions between the components in the interactive portion of the project, so that users could click seamlessly back to a higher level of the computer with seamless animation at any time. As it stands now, the user has to view the entire explanation of a component before being able to return in order to check out another component because I did not animate the return of the elements in the case from every intermediate position they appear in during their explanations. This would be a straightforward, but extremely time-consuming fix to implement, which is why it does not currently appear in the project, but it is definitely something that I am working on implementing in the future.

Future of the Project:

My lofty goal for this project is to make it an important online resource for finding information on the hardware and internal workings of the modern computer. To that end, I plan on continuing to update the explanations of computer hardware as new technologies are created and added to computers. If major stylistic changes are made to computers, those will be added as well. I would also like to implement a completely separate section for computer software and programming language in the future, but that information is much more complex than hardware descriptions, harder to distill, and less important to basic understanding of computers, so it was not within the scope of this project's main goal, which was to widen the knowledge base of information important to understanding how computers work. At some point, if this project appears to be as effective a resource as I hope it will be, I will also add an optional feedback section as an unobtrusive replacement for my initial survey idea but that will still provide me with user information that can be used to keep information on the site updated and relevant and can be helpful in increasing the overall effectiveness of the site as a learning resource and a visual tool for learning about the hardware that runs your computer.

Now, I would like to give you a chance to view the project in its entirety. Please check out the interactive Flash presentation and the text-based walkthrough. I would also like to open the floor for questions at this time. Thank you for your time.