Project Proposal

MIT 515
Spring 2003

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Project: TechKnowTeach: *Seamless* Technology Integration

Teachers in the New Hanover County Schools are expected to prepare instruction that can integrate technology in a seamless/transparent manner. The course has been developed for public school teachers and provides an online environment that incorporates Constructivist principles and Problem-Based Learning activities. The learning activities and opportunities of this course offer learners the necessary support to construct solutions and skills such as classroom management, copyright and fair use policies, software and hardware troubleshooting, and problem-based learning. These skills are needed for the successful integration of the North Carolina Computer Skills/Technology Standard Curriculum and the Core curriculum of any subject area. The activities found in this course are problem-based and the learners will be expected to create units that are also problem-based. Individuals participating in this course will work independently on unit plans as a result of problem-based learning activities, but will have the opportunity to work collaboratively with other participants on several activities throughout the course.

Context and audience

Audience –The primary audience are public schoolteachers in the New Hanover County School System that have at least five years of experience in classroom instruction. Secondary to this are teachers within the New Hanover County School System with less teaching experience as the intended audience and far less motivation to integrate and teach computer skills/technology per the NC Standard Course of Study. The age group of these teachers ranges from 25-45 years old and are a combination of women and men. The teachers' have earned a minimum of a four-year college Bachelor of Arts degree in education and some having received a master's degree in an equivalent area with focus in education. Their reading skills are at the collegiate level.

Learner characteristics include:

1) Obtain above the required amount of technology renewal credits in accordance with county licensing requirements (30 hours within 5 years)

2) Persistently seek out opportunities for collaboration through problem solving by serving on committees such as school technology teams, leadership/school improvement teams, and literacy teams at each school.

3) Have the readiness to integrate technology into existing curriculum instruction by submitting at least one integrated technology lesson for every two weeks of lesson plans

4) Show interests in technology components in education such as maintaining basic teacher websites (Schoolnotes.com) and using email to communicate with the community as well as other faculty.

Needs

The North Carolina Standard Course of Study identifies specific computer skills/technology objectives for every grade level. As a part of the New Hanover County Technology Plan, the skills embedded in these objectives must be taught in every subject area; these objectives are stated in the NHCS Technology Plan for 2001-2005. The goal for instruction is a seamless/transparent move toward technology by "utilizing tested instructional practices and curriculum to support high student achievement." As listed within the technology plan, Objective: 1.1 states that teachers will use tools (hardware), programs (software), and strategies (pedagogies such as problem-based learning) to strengthen the technology integration into the appropriate NC Standard Course of Study.

Currently, based upon survey results, 75% of the included audiences for this project are not currently using the North Carolina Standards for Technology to develop academic experiences and opportunities enhanced by the North Carolina Standard Course of Study core curriculum. Teachers do not have the skills or knowledge to perform the integration of technology into the curriculum in a seamless manner. It was determined that although these teachers have technology (hardware/software) and resources for the integration of technology into the core curriculum, they are currently not addressing technology integration for a number of reasons:

1) Lack of incentive to do more than what is expected

2) Feeling of a lack of technology support for this type of teaching within the classroom (hardware such as scan converters for computer to television display, network availability including Internet in the classroom, immediate help available as needed during a lesson)

3) Fear of lack of skills in the use of specific software such as *PowerPoint* and *Microsoft Works*

4) Lack of experiences with a technology hardware such as digital cameras and scanners

5) Lack of understanding of the various pedagogical strategies to integrate technology into core curriculum in the least restrictive means

The proposed solution, in response to the educational needs assessment, is to implement a problem-based learning approach to selected topics in the integration of teaching computer skills/technology per the NC Standard Course of Study.

The audience targeted for this project is in-service teachers with five years or more experience who have not had the necessary training with respect to the integration of technology into core curriculum standards. The performance problem answered through this project has been identified in two parts: 1, as an incentive deficiency—these teachers do not receive any additional benefits, pay, salary, or accolades for their efforts to integrate technology into classroom teaching and learning; 2, skills knowledge and resources—there is a need for the adopting of skills, knowledge, and strategies by this targeted audience to use the North Carolina Computer Skills/Technology Standards Curriculum for the integration with the core curriculum of any subject area.

Other factors that contribute to this problem include:

1) Lack of funding for future workshops and training

2) Lack of support for staff after this project to continue their learning of the integration of technology into core curriculum

3) Lack of experts within each school in New Hanover County to model and/or support the teachers who successfully complete this project to continue their integration of technology into core curriculum

4) Lack of available technology resources (such as hardware—PCs, Laptops, *Jornadas*, etc. and software—Educational or Supportive of Educational tasks);
Lack of pedagogical knowledge with respect to strategies and models to assist in the integration of technology into core curriculum

5) Lack of technical knowledge to use/work with hardware and software available;
A learning environment not conducive to the seamless integration of technology into core curriculum

6) A work environment not conducive to the motivation for seamless integration of technology into core curriculum teaching and learning experiences.

Environment

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New Hanover County (NHC) School system is made up of 24 elementary schools, and 12 secondary schools. There are four major departments, all of which are regulated according to policies set by New Hanover County school board members, North Carolina State legislators, NC Department of Public Instruction, administrators, parents, teachers, and students. The NC Standard Course of Study is the foundation of all teaching in New Hanover County. Peers, parents, administrators, and other county observers hold teachers accountable through the ongoing observations. End of Grade and Computer Skills testing is administered to every child covering all grade levels K-12.

Hardware, software, and other resources available:

1) The schools currently have an average of 3-5 computers for every student and Internet access is available in every classroom. At least one computer is placed in each classroom. Printers are available in most classrooms. Flatbed scanners scan converters, data projectors, and digital cameras can be checked out from the school media center or the county technology department.

2) Microsoft Office and Microsoft Works is available in all labs an every classroom. Additional software may vary per school.

3) One general lab of at least 30-networked computers is in every school. At least one part-time or full-time computer resource teacher exists and a technology team of teachers with some troubleshooting skills is organized within each school.

Stakeholders

1) Teachers participating in this project – must adhere to the standards of the NC Core and Technology Curriculum, will be introduced to problem-based learning within technology

2) Teachers not participating in this project who are either a part of the Secondary audience or that teach in New Hanover County – must also adhere to the standards of the curriculum and will look to the primary audience for assistance in the future, also new to PBL

3) Students of New Hanover County Schools – are directly affected by the learning environment and activities within their classrooms, must pass the NC Computer Competency Tests in order to receive a high school diploma (multiple choice and performance tests are administered every year beginning in the 8th grade), will benefit from PBL use

4) Parents of students of New Hanover County Schools – are responsible for supporting their own child within the public school system, can provide community support (money, volunteer hours) for all schools, can be used as a resource for PBL

5) Administrators of New Hanover County Schools – responsible for making sure that teachers are teaching the standard course of study, responsible for providing a budget and materials for schools' technology needs, can be a constraint or a resource, situations may vary per school (some administrators support technology integrations more than others)

6) NCDPI Curriculum guide directors – responsible for development of the standard course of study, may be a constraint to PBL due to Accountability standards (testing) that is highly emphasized

7) Technology Facilitators/CRTs of New Hanover County Schools – provides technical and instructional support for all teachers, can be used as an immediate resource for PBL

Tasks

In Unit 1, teachers will face scenarios that may occur in successfully completing an online course. The mission is to become familiar with classmates; Start using the WebCT collaboration tools; understand the basics of problem-based learning (via CDROM); and begin evaluating online resources. During initial period

of familiarizing the students with the online environment of course management software (WebCT), the five major skills needed for successful information problem solving will be introduced. The student will need to recognize *a need for* information, identify and locate appropriate information sources, learn how to gain access to the information contained in those sources, evaluate the quality of information, organize and use the information effectively. The material will integrate technology that can be used when teaching students to use the Internet and related software or hardware.

In Unit 2, teachers will face scenarios that may occur in the classroom. The mission is to begin creating step-by-step instructions for the use of basic technology tools; To learn how to use a few technology tools that are commonly taught and used in the classroom. During technology-integrated lessons, the problems arise. The teachers will need to create materials that can be used when teaching students to use software or hardware. Consulting online resources, co-workers, and classmates will be necessary during the unit. They will create a basic spreadsheet and graph, word processing document, a short PowerPoint presentation and use a digital camera. Using online and print resources, the teachers will learn how to use the technology components to create the final products.

In Unit 3, teachers will be faced with classroom management and assessment scenarios that may arise in a technologically enhanced environment. The learners will work independently and collaboratively to achieve a solution to each scenario. These solutions to each scenario will contain methods to keep students on task and rubrics to grade projects created by the assignment. These solutions may be presented in a word document or a power point presentation. The learner will have to use online resources and communication tools contained within WebCT.

Unit 4 combines the efforts of the first three units and adds the component of copyright and fair use. The mission is to be able to create lessons that integrate technology seamlessly and at the same time adhere to policies of fair use. Students will create a final weekly lesson plan and student samples of work. Within the lesson learners must identify special needs modifications as well as various strategies for classroom management.

Using Jonassen's design model for development of instructional activities, the online course will be designed to implement problem-based learning within a constructivist-learning environment.

PBL is valued in a constructivist-learning environment; it is a way of encouraging higher level learning outcomes in relation to cognition and student learning. The processes that lead to a deep level of understanding involves the active seeking of the learner to reach meaningful interpretation of newly learned skills and knowledge—where there is personal significance to the new knowledge and understanding that has been constructed.

The activities and learning environment used in this project (PBL) is an approach to teaching and learning that requires the student to use higher order learning processes. Students who are presented with complex problems need to utilize strategies such as analyzing, comparing and contrasting, explaining causes, and hypothesizing, and to apply the outcome of these processes towards the development of a solution to the problem(s) presented. Similarly, a student who does not apply these processes simply cannot complete the task as lower order processes such as memorizing, describing, or following a simple procedure are insufficient.

Embedded in our learning environment will be opportunities for group work and collaborative tasks. As the problems used in PBL are complex, students are required to use effective strategies to find ways of reinterpreting the skills and knowledge presented to reach a solution. Research has shown that collaborative learning environments promote deeper understanding and problem solving, as all learners bring a new approach or different means of solving problems.

Instructional goals

Students will demonstrate technology integration while creating lessons for use in the classroom. Individual assignments as well as group activities must make use of technology in a seamless manner.

Students will be given appropriate real-world problems that will engage learners and enhance the teaching of the NC standard curriculum by promoting problem solving.

Students will apply Internet copyright laws and fair use policies. Application of these policies will be used when creating the unit for the classroom. The unit for the students of New Hanover County will incorporate the learning of these laws and policies.

Students will find technology resources within the use of software (PowerPoint, Internet Explorer, Microsoft Works, or Microsoft Publisher), hardware (scan converters, digital cameras, flatbed scanners, computers, laptops, data projectors), and problem-based learning techniques, to strengthen technology integration and enhance learning of the NC Standard Course of Study.

Students will select appropriate technology to assess student performance and modify instruction based on various learning styles and needs of their students. Students must evaluate Internet resources in order to find those most suitable for the learners.

Description of the Product

The online course is developed for public school teachers and provides a learning environment that incorporates Constructivist principles and Problem-Based Learning activities. Through the instructional activities, learners construct solutions and necessary skills such as classroom management, copyright and fair use policies, software and hardware troubleshooting, and technology integration. It is an online course that contains all assignments, lectures, resources, assessment, and instructional/environmental support. This environment exists within WebCT as well as on the World Wide Web via the VAX server provided by UNCW. Students will work in groups when working on some activities and will work independently using tools within WebCT (email, chat, forum, quiz, whiteboard, etc.) when engaging in communication with group members and the instructor. Using the problem-based learning, the students work independently, but will have the opportunity to work collaboratively to solve real-world problems that exist within the New Hanover County public school system. The project focuses primarily on the integration of technology for the instructional experiences of students; participants will create lessons that may be print or web based that integrates technology as a final product. A set of weekly lesson plans will be created and a written rational that elaborates the plans. A sample student product will also be submitted.

System Requirements for the online course:

1) PC/Laptop/MAC/ or other compatible device
2) Processor: Celeron or Pentium (450MHZ or better)
3) RAM: 128MB or better Hard Drive: at least 2GB free space
4) Internet Explorer 5.0 or better, Netscape 6.0 or better.
5) Video card and sound card in machine for multimedia presentations online.
6) Must have software applicable for all activities-ex. PowerPoint, Microsoft Word, etc. (free copies of Microsoft Office – a limited version is available online at www.openoffice.org)
7) Should have storage drives on machine and media to back up or store activities for future use. (Floppy disk and floppies or CD writer and CDR or Zip drive and Zip disks)

Content

This course, named: TechKnowTeach: Seamless Technology Integration provides an online environment that incorporates Constructivist principles and Problem-Based Learning activities. The course assists in the attainment of the necessary knowledge and skills for the successful integration of the North Carolina Computer Skills/Technology Standard Curriculum and the Core curriculum of any subject area through the creation of units that are predominantly problem-based and will make use of online learning tools deploying social-contextual support for students' learning. Those taking this course work independently on unit plans

as a result of Problem-Based learning activities, and will have the opportunity to work collaboratively with other participants on several activities throughout the course. This course is based on Jonassen's Constructivist Learning Environment (CLE), which uses problem-based learning (PBL) approach for the design of the learning environment and activities.

Units:

1) *Getting Started with On-line Learning:* This unit contains the introduction of students to the online environment and each other. Problems will require students to navigate through the environment and create a way to introduce themselves to the rest of the class.

2) *Software and Hardware Management in Integration*: The students must solve problems involving a multitude of software, hardware devices. Students learn the basics of the software and hardware that is widely used in NHC.

3) *Assessment and Management*: The learner will again be put through several scenarios and asked to come up with a solution. These scenarios will involve PBL assessment and classroom management with technology. Learners will create a weeklong set of lessons that will integrate technology. This is the first part of the culminating activity/project for the course.

4) *Technology Integration and Copyright Laws*: This unit will put the learner through scenarios that involve copyright and intellectual property. Students will create a quality, copyright compliant class project using Multimedia components for future use in classroom instruction.

The activities will require the learner to apply critical thinking skills to solve complex problems and provide the experience the novice learner lacks.

Content will also include lectures on the following topics:

1) NC Computer Skills/Technology Curriculum – NC objectives for each grade level, vocabulary, software, and hardware, ethics, and telecommunication

2) Copyright and fair use policies for educators-laws and policies pertaining to resources for use within technology projects used in education

3) Special Education and Assistive Technology-special education needs of the learning disabled and academically gifted child, available technology to assist a child with special needs

4) Management of the classroom and computer lab – how to maintain control and high time on task while teaching in a computer lab setting, media center, and classroom with one or more computers

5) Multimedia Assessment – designing rubrics to assess student projects, resources to help create assessments, when and how to use them effectively

Functional specifications of instructional components

The course will be contained in two online environments. WebCT will contain learning activities and the VAX environment will contain the course information and instructional material. The home page for the course will be housed in the VAX server and the page will contain the Title of the course along with the presentation of the overall problem. On the side navigation bar there will be links to WebCT along with Resources, Schedule, Contacts, and Help. Across the bottom of the page will be links to the curriculum standards for subjects in order for teachers to have quick and easy access to them.
The email, chat, and forum activities will be contained in the WebCT environment. They will be provided e-mail, forum discussion and chat spaces, additional resources and PBL learning activities to assist them along their journey.

Based on the CLE model, the course learning environment and activities are designed as follows:

Problem Representation:

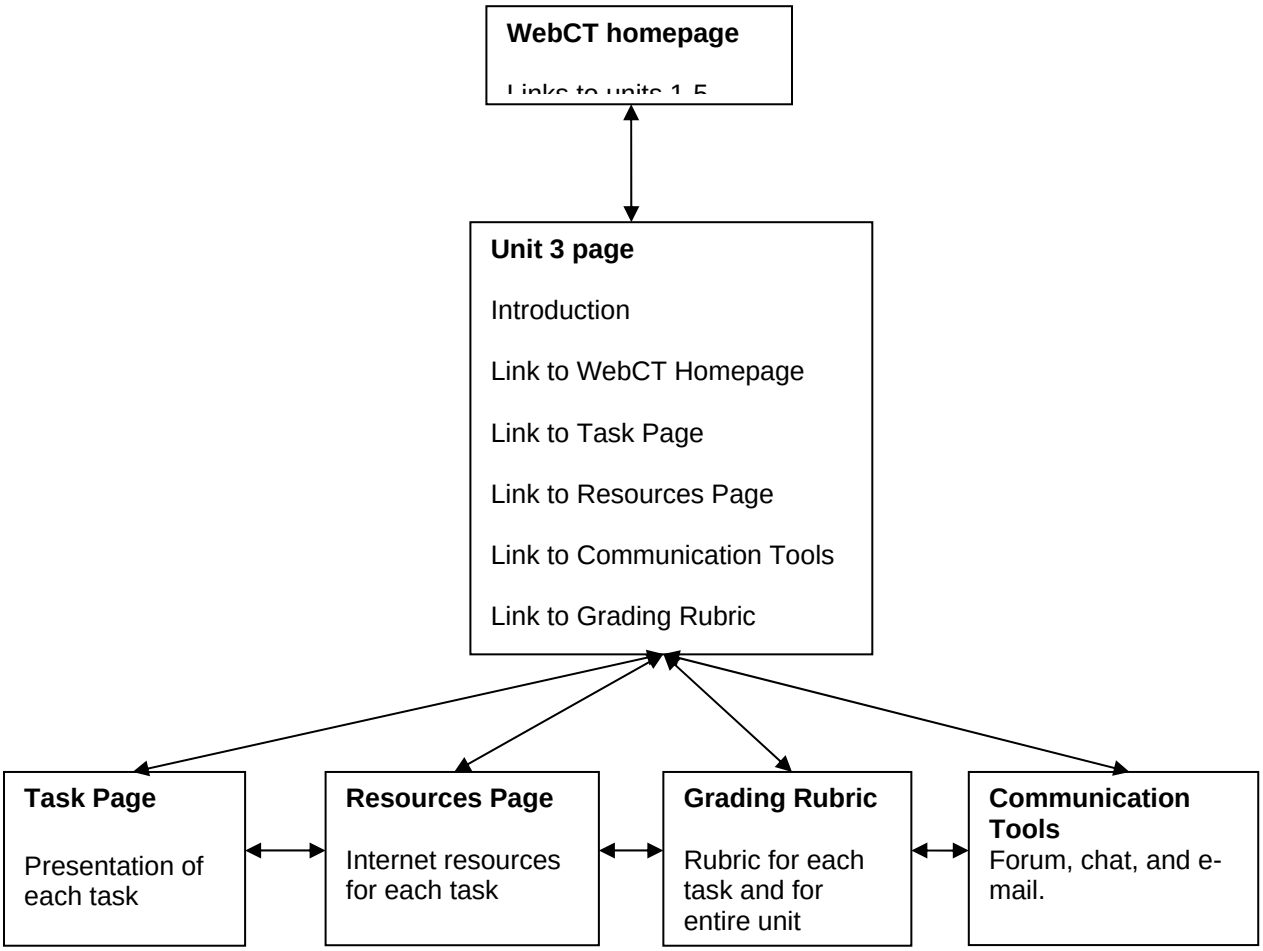
- A real-world question or problem within the realm of the public education system that relates to the integration of technology into the standard course of study. The criteria for problem selection will be: 1. Authentic 2. Relevant to each learner 3. Many ways to solve it. 4. Interesting 5. Challenging
- Each unit will involve a problem for the students to resolve. To engage students' attention and to promote their learning motivation, the problem will be related to their work environments. These real-world solutions will be helpful to all the learners.
- Learners will be provided with specific lists of resources and suggestions for persons to consult.
- Group activities that must utilize the collaborative and conversation tools provided within the online environment. The learners facilitate discussions and develop mini presentations of their conclusions and solutions.
- Individual reflection activities will be exchanged with other students online. Once students develop several different solutions to their problems, the instructor provides an outlined evaluation form for each student to complete. It asks learners to reflect on their strategies and assumptions, explain their responses, and describe whether they should make further changes.
- Lesson plan template for final presentation of technology integrated lessons

Manipulation Space

Components of CLEs	Functional specifications	Instructional components & design
Related cases	Scaffold learners memory Provide cognitive complexity to represent multiple perspectives	There will be an image button titled “Cases” on the course menu bar. The Cases area will be structured as a library or database, which collects the stories, cases, or examples from teachers who had integrated technologies into their teaching and learning.
Information resources	Provide information bank or repository of information about the subject/topic Provide Helpful or needed information for solving the problem	There will be an image button titled “Resources” on the course menu bar. The information in the resources area will include: text documents, PDF files, web sites for topics related, publications, and any other information that is appropriate for helping learners. Some of these websites include *LearnNC, Marcopolo, Kathy Schrock,* and *Landmark Project* are database type sites that help teachers find lesson plans online. Many types of handouts for teaching tools such as *Microsoft Works* and *PowerPoint* will be made available in this resource list. Search engines *Google*, and *AllTheWeb* are on this list and are the top recommended engines to use.
Cognitive tools • Knowledge modeling tools • Performance support • Information gathering	Scaffold learners’ ability to perform the task Stimulate thinking, Engage information processing Enable the skills that are required to solve the problem	Communication tools within WebCT (forum, chat, email) give the learner places to combine efforts with others, reflect on each others work, ask questions, and post ideas. The learners will use PowerPoint and Microsoft Works to create lessons, gather and display data, and create student sample work. Handouts for the classrooms will also be made using these tools.

Conversation & collaboration tools • Online communication tools	Promote the forming of a learning community Promote collaborative learning	WebCT tools will be used to form a community of learners. The Forum area will be divided by topics for each unit that require group as well as individual work. High priority is placed on the use of these areas every week. Students will faciliate their own discussions and be required to reflect on the ideas of others. Discussions will be setup in synchronous chat at least once a week. During the chat discussions, learners will discuss information pertaining the each case presented in the units. Email is a tool that should be used for assignments that must be turned in for grading. All other concerns and questions should be addressed in the public forum so that other students may benefit from the inquiries.

Diagram of Site Map for WebCT



Social contextual support

Learner activities – Each unit consists of real-world problems and group and individual tasks. The learner must explore the problems by consulting with experts and reviewing online resources. After gathering information, each learner must propose solutions to the problems and post them into the forum for discussion. The learner will read each proposal and raise questions and concerns about each solution. The discussions will foster reflection of the problem solving techniques.

Instructional activities – The instructor's role is important in this area because the consistant needs proper scaffolding, coaching, and feedback in order to stay on task and move in the right direction. While representing each problem, the instructor will provide specific guidelines for the following:

- Important issues and questions to consider for each scenario (learners will be encouraged to reflect on their strategies and assumptions, explain their responses, and describe whether they should make further changes)
- Persons and resources to consult *(Information Resources that are both static and dynamic and provide an in depth look at current issues that relate to the real-world problem)*
- Expectations for group and individual activities (*Group activities that must utilize the collaborative and conversation tools provided within the online environment)*
- Rubrics for assessments of each activity

The guidelines for each unit task may vary but the overall structures and goals remain the same. The learners must present solutions to each problem and use the specific resources named to develop the solutions.

The instructor must also participate in all forum discussions to provide feedback, stimulate responses, and re-direct learners as needed.

Description of the instructional event

Elaine is a teacher of a middle school in New Hanover County School system enrolls in the TechKnowTeach online course. She visits the home page of the site, which exists on the UNCW server. On the home page she sees the title of the course along with the presentation of the overall problem. Contact Information is provided here for quick and easy access. On the side navigation bar, there are links to Syllabus, Schedule, WebCT, Resources (will also be divided within each unit), Contacts, and Help. On the Resources page as well as on the home page, there is a bottom navigation bar of resources. These are links to the curriculum standards from the NC Department of Public Instruction for subjects. This will give the teachers quick and easy access to them.

Elaine's first step is to examine the syllabus and become familiar with class expectations. She sees descriptions of the "Overall Problem" that must be solved and other details about grading, readings, course policies, etc.

After becoming familiar with the syllabus, she decides to take a look at the schedule. The schedule is a table of all the class units and the dates that they plan to work on each one. The dates span over a specific period of time. She notices that there are four major units. Under each unit is a brief description of the overall problems, the time period for it. There are directions that tell her to go to WebCT in order to begin the unit. A link to directions of how to log into WebCT is here. It explains what it is used for and when to use it. Unit One (within WebCT) captures her attention and tells her to "START HERE." This is a link to WebCT.

The WebCT link is the next and requires usernames and passwords. It also introduces the learners to each other with an opening "My Bio" activity. There is an introduction to problem-based learning in the form of resource links. From here she is given direction to proceed to WebCT for every unit to begin posting, email, and online collaboration with the other learners and the instructor.

On her WebCT home page, she sees links to Units, Communication (which contains e-mail, forum, chat, whiteboard), and Resources.

Elaine starts with the Units in WebCT. She will be presented with the overall problem along with units and activities to help them solve this problem. The unit tasks are listed and rubrics for each task outlines the expectations. She interacts with her group in the communication areas and posts all assignments in designated forums and email to the instructor. She will take some online quizzes as assigned and receive immediate feedback. All assessments will be used electronically.

Evaluation/usability strategy

Formative Evaluation

1) One-on-One Evaluation:

Upon completion of the course there will be a one on one evaluation with a potential student and one of the designers. This potential student will provide information and feedback about the site verbally and by survey upon completion. Three of these one-on-one evaluations will be conducted simultaneously. From the information collected the site will be modified according to information collected. This will be to edit content.

2) Usability Test:

This will be a one on one test with users to explore the usability of the website. The designers will be looking for problems with navigation or organization of the site that students may be having trouble with. There will be three of these evaluations as well. Observation and survey upon completion of test will collect data. These tests will be video taped and evaluated in case the designer observing misses any trouble spots. Once this test is completed, the site will be modified accordingly.

Learner Assessment

Students are required to complete online quizzes in multiple-choice and true/false formats. These quizzes provide immediate feedback. Participation in discussion forums by posting comments and summaries as well as reflect and respond to classmates' opinions and statements is expected. Students play roles during these forums and lead the discussions on a rotation. In order to complete group activities, students must participate in chats and submit various multimedia projects. The grading of the completion of these tasks, final products, and reflections is based on a combination of quiz percentage grades, participation percentages, and overall content percentages.

Summative Evaluation

Students are required to complete some online quizzes in multiple-choice and true/false formats. These quizzes provide immediate feedback. Participation in discussion forums by posting comments and summaries as well as reflect and respond to classmates' opinions and statements is expected. Students play roles during these forums and lead the discussions on a rotation. In order to complete group activities, students must participate in chats and submit various multimedia projects. The grading of the completion of these tasks, final products, and reflections is based on a combination of quiz percentage grades, participation percentages, and overall content percentages. The students will also be expected to complete an evaluation form at the completion of the course. This form will provide feedback for designers in order to make changes for future students. This evaluation form will be in survey form and will request student opinions on the overall course and specific parts of the course.