Online Technologies and the Virtual Classroom: Addressing an Educational Need

LST 403: Learning Environments - Dr. Bishop

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# Addressing an Educational Need: The Virtual Classroom

Community Colleges exist to serve their local communities. Many of the larger Community Colleges are already well-immersed in Web-based technology and offer their students a variety of on and off campus classes. In order to stay current and competitive with today's market, Luddite Community College (LCC) must provide greater availability of online course offerings, not only for the currently enrolled students, but for prospective students willing to take online classes that live a distance away from the college.

As the newly appointed technology coordinator of Audits Community College, I have been asked to offer suggestions for the technology intervention program concerning the expansion of the College's online course offerings. LCC would like to develop their "virtual classroom" by offering more educational technology programs for use by off-campus students. This evaluative report addresses the following four sectioned areas: (a) Description and analysis of the target audience, (b) description and analysis of the necessary technology, (c) final recommendation for the "virtual classroom" technologies, and (d) implementation strategy for the expansion of the "virtual classroom."

The overall goal for incorporating the new technology products is to extend LCC's visibility beyond the local community and to provide additional resources to the local community. The successful process will be used as a prototype for the inclusion of additional online classes in the future.

#### Existing Learning Environment

The Luddite Community College is located in Northeast Pennsylvania, USA and has 5 off-site locations. Established in 1966, Luddite Community College (LCC) is a comprehensive,

two-year, publicly supported community college. The college is accredited by the Middle States Association of Colleges and Secondary Schools and is sponsored by all nine school districts in Luddite County. The mission of LCC is to respond to the community by providing affordable, accessible, and quality education.

The socio-economic status of the surrounding is primarily white non-hispanic, with approximately 20% Hispanic, 15% Black, 10% Asian, and 5% other. The median resident of the local community is 39 years old and the median household income is \$56,000.00.

Luddite's Admissions office offers statistics for student enrollment for the Fall 2005 Credit Program. The average age of the enrolled student is 27 years old. Table 1 shows enrollment numbers for various segments of the student population. Full-time students carried an average course load of 13.5 credit hours; part-time students carried an average course load of 5.4 credit hours. Full-time and part-time students enrolled in courses totaled 56,308 credit hours; and full-time and part-time students. Table 2 shows the distribution of degrees conferred. The student to faculty Ratio is 14:1 - 14 students to 1 faculty member. Table 3 shows the proportion of full and part-time faculty and staff.

Luddite Community College's organizational characteristics include the Board of Trustees, Executive officers, faculty, administration, and staff. The Board is composed of representatives from each of the college's nine sponsoring school districts. The Trustees ensure that the mission of the college is interpreted, by the administration, into working policies that best serve the needs of the college. The Executive officers provide leadership and execute the policies. Luddite's faculty is dedicated to the students and committed to the improvement of its educational offerings and services. Administration and Staff monitor and support the day to day activities of the college. In general, all existing curricula must accept the new technology to some degree, but in particular, the online classes that are recommended in this report will incorporate the existing Graphic Design curricula. Classes, such as Photoshop and Dreamweaver, typically taught in classroom computer labs will be adapted for online transmission.

Although the emphasis for new technology in this report is on the virtual classroom, there is hardware available to the students. Students who are within the supporting school districts have access to laptops from LCC's borrowing library.

Luddite has long relied on local, state, and federal funding for financial help in all areas of the college's needs. While state funding helps keep tuitions low, local funding has remained a steady part of the budget. The financial stress has prompted community colleges to collaborate with other institutions and corporations, especially for new technology. For example, the Pennsylvania Virtual Community College Consortium (PAVCCC) is a partnership among 14 of Pennsylvania's community colleges designed to give all Pennsylvanians access to higher education opportunities including courses, degree programs, and student services. The collaborative model of the PAVCCC allows students to enroll in a limited number of distance learning courses from colleges other than their home college and transfer the credits back to the home college. Student's who live outside of the local area are encourage to solicit their community libraries, schools, or the PAVCCC for assistance in acquiring technical assistance.

The Luddite's are looking forward to the challenges of using online media to deliver instruction. In preparation for "going live" with the virtual classes, the teachers have already incorporated online components within the existing curriculum. The teachers, trainers, and staff at LCC have access to the Microsoft Office Products such as Word processing, Excel spreadsheet, Access database, and PowerPoint. Internet access provides free online Web services such as blogs, email, instant messaging, and web surfing. Through the use of the internet, blogs, and email, teachers already receive assignments from the students. These "soft" technology tools, already a part of the learning environment, have been well-accepted by the students.

# Target Audience: Analyzing the learner

The profile of the LCC student is consistent with the broad profile of statistics provided by the American Association of Community Colleges (AACC). There is no typical Community College student and reasons for their enrollment, vary as much as their ages. They are high school graduates on a fast track to a good job or two-year students eventually transferring to a four-year program. They are students earning credits for degrees or certificates; they are life long learners taking noncredit courses. They are adults returning to class to update their skills, extend their knowledge base, and change their careers. More than 80 percent of students balance studies with full-time or part-time work. They work and balance family responsibilities.

In general, the student is looking to add college level experiences to his/her life. But, there are other reasons for attending the Community College. Low tuition and a local location are among the most popular reasons students choose Community Colleges and LCC offers both. Low tuition has a universal appeal, but it is especially appealing for the low income household. Not only has the cost of education risen steadily over the past 35 years, but the increases for private and independent colleges have increased exponentially higher than their community college cousins. Location of the college close to home attributes to 58% female enrollment. Women need to work around spouses, children, and babysitters schedules. Location of the college close to urban areas attribute to 30% minority student enrollment.

Furthermore, community colleges are reporting a new enrollment phenomenon. They are the students with Bachelor's and other degrees who attend classes for computer instruction in order to keep up with the demands of technology in the workplace. "At community colleges, people can continue to learn at any point in their lives. The fast pace of technological innovations and increasing frequency of job and career changes can create the potential for people to return to community colleges again and again (AACC, 2004)."

# Analyzing the Learner: Strengths

The strengths of each community college student must be analyzed individually, because their strengths are as varied as their reasons for being enrolled. All students bring with them some form of enabling attitudes and life experiences.

The two year degree student brings with them

- a desire to learn about a subject of interest
- basic academic learning skills acquired through the satisfactory completion of high school
- current basic technology skills learned through school
- advanced technology skills depending on their personal and social interests

The returning student brings with them

- a desire to increase their knowledge about a subject of interest
- basic and advanced academic learning skills through previous educational and employment experiences
- a variety of technical skills depending on their jobs

# Analyzing the Learner: Weaknesses

The weaknesses of each community college student must also be analyzed individually.

All students bring with them some form of disabling attitudes and life experiences.

The two year degree student brings with them

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- low income homes may not have access to technology at home
- single parent students have conflicting schedules
- high school graduates with low SAT test scores
- high school graduates with learning disabilities

# The returning student brings with them

- academic learning weaknesses due to lapsed time between taking classes
- negative employment experiences

## Analyzing the Learner: Design Strategies

Students bring with them plenty of preexisting issues to the classroom, both positive and negative, such as financial, social, academic, and psychological. How do technologies and constructivist perspectives genuinely enhance learning strategies to help capitalize on students' known strengths and strategies to offset the students' weaknesses? A constructivist's learner-centered approach, as explained by Sherman and Kurshan (2005), focuses instruction on experiences, culture and knowledge that learners bring to the class. Characteristics of effective learning environments consistent with modern constructivist theory promote deeper, more substantive learning. Learner-centered instruction should incorporate characteristics such as: interesting, real life, social, active, time, feedback, and supportive.

The challenge for educators is to make these characteristics regular features of your classroom.

- 1. In order to capitalize on the learners' desire to learn about web designing, the new technology should challenge the student's existing knowledge.
- In order to capitalize on the students' basic academic skills taught in high school, technologies should provide instructional scaffolding that will *support* students as they progress.

- 3. In order to capitalize on the learners' basic aptitude for learning, technologies should be an effective tool to promote this *interested* and *active* exploration.
- 4. In order to capitalize on the basic technology skills learned through school, the new technology should relate new learning experiences to prior knowledge.
- 5. In order to capitalize on students' advanced technology skills, students should be encourage to be share their ideas to with the group (*social*). This collaboration improves their thinking skills and gain new knowledge.
- 6. In order to take advantage of the returning student's previous employment experiences, the new technology should construct new understandings based on what they already know.
- In order to overcome learners' problem with learning disabilities, the new technology should assist students search for activities that are consistent with students' learning needs.
- 8. In order to overcome academic weakness, the new technology should encourage students to organize their knowledge using computer-based tools. Combined with *feedback* from the teacher, the result should be a much higher potential for transfer with deeper and more meaningful learning.
- 9. In order to help students overcome low self-esteem, there is a wide range of technologybase materials available on many topics to self-select learning activities that are developmentally and topic appropriate as well as capture their *personal interests*.
- 10. In order to address areas of potential difficulty students have with low achievement the learners can employ technologies such as search engines to mirror the strategies they will

use in *real life* seek answers. In this way, *real life* in school becomes as much a second nature response as *real life* outside of school.

Teachers that facilitate learning with "frequent feedback, consistent support, time to learn," and present classes that are "active, interesting, learner centered, and focused on real life have been shown to be more effective with all learners (Driscoll, 2005; Sherman & Kurshan, 2005)."

# Technology Analysis

In order to start the process of expanding the "online classroom", the following products have been suggested as starting points for investigation: Blackboard, Photoshop, Dreamweaver, Product tutorials, and Picasa.

## Technology #1: Blackboard Learning System<sup>TM</sup>

Product name and access information

Blackboard<sup>TM</sup> Academic Suite: <u>http://www.blackboard.com/products/as/</u> Blackboard Inc. has worldwide headquarters with the nearest office located at 1899 L Street NW Washington, DC 20036

# Short Description

The Blackboard Learning System<sup>™</sup> is a software application for institutions dedicated to teaching and learning. Intuitive and easy-to-use, this product has powerful capabilities in three key areas important to educators: instruction, communication, and assessment. Blackboard is a Web-based application that facilitates the provision of course information, the distribution of learning resources, file sharing, and online assessment and feedback.

The technology of Blackboard is considered a Content Management System. The course management tools offered by Blackboard simplify the task of creating, managing, and reusing learning content by maintaining subject matter in a central repository.

The learning theory that underlies the design of Blackboard is Constructivism, a theory that assumes knowledge is constructed and social interactions are important to knowledge construction. Blackboard supports constructivist's method of instruction (a) collaborative learning, by facilitation of communication between the teachers and students, and among students, both as a whole class and in separate discussions forums; and (b) course management tools, by providing teachers with many tracking tools. Blackboard supports constructivist's conditions for instruction (a) complex and relevant learning environment, by providing an interface that provides multiple interactions; and (b) social negation, as an extension of the face to face collaboration. Blackboard supports constructivist's learning goals (a) critical thinking, with "virtual critical thinking" applications such as online discussion groups; and (b) self regulation, with teachers tailored curriculum affording many students the opportunity to engage more fully in their own learning (Curtis & Lawson, 2001; Driscoll, 2005).

#### Pros

Implementing online collaborative learning initiates high levels of interaction among students contributing to a sense of classroom community. Blackboard extends the face to face collaborative situation. Educators can also use the platform to complement classroom instruction and even tailor the curriculum for individual students. On-line learners can take advantage of the "learn anytime" characteristics of the Internet by accessing the Blackboard course seven days per week, 24 hours per day. Students have more time between interactions for consideration and generation of a well thought-out response.

Cons

Most of Blackboard's online "conversations" occur asynchronously which can cause substantial delays in receiving replies causing a noticeable lack of spontaneity. Non-verbal cues may reduce visual prompts, thereby reducing the range of the communication.

# **Overall Evaluation**

An ideal e-learning platform is one that offers maximum productivity and greatest ease of use for administrators, teachers, and students without sacrificing versatility. A teacher should be able to post homework, create exam questions, host discussion groups, communicate with students, and use all other standard features of the system without difficulty. The latest version of Blackboard is an e-learning platform that supports course management for creating and taking courses on the Web, online campus communities for interacting and collaborating with peers and teachers, integration with multiple administration systems, and an institution-wide portal. Blackboard has integrated add-on software for development and growth.

# Technology #2: Software - Dreamweaver

# Product name and access information

Adobe Dreamweaver 8: <u>http://www.macromedia.com/software/dreamweaver/</u> Adobe Systems Inc. has worldwide headquarters with the nearest office located McLean, VA.

# Short Description

Dreamweaver is a hypermedia Web development tool that enables the user to design, develop and maintain interactive standards-based Websites and applications. Dreamweaver is a design and code editor. Software applications such as hypermedia tools allow people to navigate through a vast amount of data. This information can be later restructured, reflected upon, or combined with other technology or media such as audio/video production tools. Dreamweaver is part of the Macromedia<sup>™</sup> Studio 8, an integrated suite of software that includes Flash, Fireworks, Contribute and Flash Paper

Dreamweaver is considered a software application tool. Software application tools extend access to technologies they utilize; Dreamweaver extends the instructional process by making instruction available online. Software applications also develop proficiency, expand knowledge, and broaden skills used to implement the technologies they employ. Students using Dreamweaver software are likely to learn more by constructing instructional materials than by studying them.

The learning theory that underlies the design of Dreamweaver is Constructivism. According to Jonassen (1998), computer software application tools are "mindtools" and "mindtools' represent a constructivist use of technology". Dreamweaver supports constructivist's method of instruction (a) microworlds and hypermedia design, by its hypermedia applications -- as opposed to linear media such as books and film; and (b) goal-based scenarios and problem-based learning, by providing students with design objectives. Dreamweaver supports constructivist's conditions for instruction (a) complex and relevant learning environment, by supporting efforts to learn and take advantage of new technologies; and (b) selfawareness of knowledge construction, by providing various types of cognitive scaffolding during the knowledge-construction process. Dreamweaver supports constructivist's learning goals (a) critical thinking, by extending students cognitive processes while learning; (b) self regulation, by acting as "mindtools" allowing students to direct their own learning; and (c) mindful reflection, by being used as a dynamic modeling tool that guides the learner through self-evaluation and reflection (Driscoll, 2005; Jonassen, 1998).

#### Pros

Dreamweaver is part of a digital design package that offers the user a variety of compatible software integration. Adding Flash and Fireworks features, allows complex Web site designing. Contribute and Flash Paper gives non-professionals some access to the process.

#### Cons

Dreamweaver is a complex program requiring many hours to master. In order to gain expertise students may be required to take more than one semester.

# **Overall Evaluation**

Dreamweaver, industry-leading standard software, is the software needed to be successful in Web design. Dreamweaver alone costs about \$399, but significant discounts are available for educational purposes. The bundle software, with the educational discount, cost about \$299.

# Technology #3: PhotoShop

Product name and access information

Adobe PhotoShop Elements: http://www.adobe.com/products/photoshop

Adobe Systems Inc. has worldwide headquarters with the nearest office located McLean, VA.

## Short Description

Adobe Photoshop software is the industry standard in desktop digital imaging for imageediting, photo-retouching, and Web-graphics solutions to create professional-quality images for print and Web. Artwork can also be created from scratch. Photoshop provides a "toolbox" that contains tools to select, edit, and view images. Other tools let users paint, draw, and type. Color management allows consistent color between digital cameras, scanners, monitors, and printers. Adobe Online provides access to the latest tutorials, quicktips, and other Web content for Photoshop Elements and other Adobe products.

Photoshop is considered a software application tool. As stated above, software application tools extend access to technologies they utilize; Photoshop extends the graphic design, photography and printing processes. By using Photoshop, students experience these graphic processes in a new way and they are very likely to learn more about them.

The learning theory that underlies the design of Photoshop is Cognitive Information Processing (CIP). Photoshop uses sensory information in the environment, a CIP precondition to learning, to supply its learners with a knowledge base. Pattern recognition, a CIP process of learning, is very important in the learning of Photoshop's artistic properties. (Driscoll, 2005)

# Pros

Photoshop makes the desktop computer a powerful tool that gives the user a professional edge.

#### Cons

Photoshop assumes a basic knowledge of digital imaging including graphic design, photography, and printing.

## **Overall Evaluation**

Since Dreamweaver, technology #2, does not come with a library of Web-ready graphics, Photoshop becomes a necessary and integral part of the Web design process. Photoshop comes full-featured and Photoshop Elements, a more basic version, is a good substitute at \$99. Photoshop is also available with an educational discount.

# Technology #4: Virtual Tutorials

#### Product name and access information

Product's Home Website: <u>http://www.macromedia.com/software/dreamweaver/evaluation/</u> Dreamweaver fever Website: <u>http://www.dreamweaverfever.com/pain/</u> TrainingTools Website: <u>http://www.trainingtools.com/online/dreamweaver4/</u> Short Description

Many free online tutorials are available to users that can introduce the learner to the basics of a software application program. These tutorials can be found on the software company's Web site, on the purchased CD, and on third-party Web sites. Virtual tutorials can be given to the students prior to the start of class and during the first couple weeks of the semester in preparation for class. Tutorials empower the students to control and organize their learning with learning software that responds to their specific needs.

Tutorials are considered a software application tool. Software application tools extend access to technologies they utilize; Tutorials extend the classroom lecture and practice. Students can be encouraged to create their own practice tutorials, thereby, developing proficiency and expanding knowledge of the technology itself as well as the specific learning it supports.

Although the virtual tutorial and the manual tutorial are based on the same design principles, the virtual tutorial may include some constructivist's elements. But overall, the learning theories that underlie the design of the tutorial are Motivation and Self-Regulation and Meaningful Reception Learning. In support of Motivation and Self-Regulation theory, tutorials are goal-directed. Tutorials allow for the adjustment of learning strategies to attain self-directed goals. In support of MRL outcomes, the learner organizes conceptual knowledge, making links between known concepts and new information resulting in learning. Another theory, the Schema theory, the explanation regarding the impact prior knowledge has to comprehension and memory, extends this process of learning. By constructing schemas, students advance their understanding of a subject as they work through the tutorials. Also, exchanging the role of the teacher with the software helps the student manage the cognitive load with self-pacing learning modules (Driscoll, 2005).

#### Pros

By using tutorials, students can get a head start on learning concepts and program commands applicable to the software needed for class. This helps to level the playing field for students who have not had enough experience using the software and students will be better prepared for class.

#### Cons

Students and teachers using third party online tutorials will need to be alert to practices that do not meet high standards of the education field.

# **Overall Evaluation**

Virtual tutorial technology can help teachers and students use time more efficiently. In some cases they are available free of charge.

# Technology #5: ePortfolio-Picasa

Product name and access information

Picasa<sup>TM</sup> Picture Simplicity: <u>http://picasa.google.com/:</u>

Google, Inc. 1600 Amphitheatre Parkway, Mountain View, CA 94043

# Short Description

The Portfolio is a commonly used procedure new graduates use to collect and showcase their creative and artistic achievements. It is a procedure the visual arts community uses to present examples of outstanding work and credentials to potential employers. The Webfolio or ePortfolio, an extension of the Portfolio, is an ideal tool for the graphic artist to continue this exposé.

Picasa Picture Simplicity is photo management software provided as a free download by Google, Inc. Picasa, an award winning Web-based portfolio tool automatically finds and organizes digital photos and movies on students' computer. Picasa can read the most common image and movie file format types. Students search, edit, and display their work in virtual albums. Work can be edited to improve color and lighting; cropped and straighten to improve composition; and effects such as tint, saturation, and glow manipulated to improve quality. A caption can be added underneath each photo to label and identify. The collage option quickly makes personalized collages from templates. User's view their work through a slideshow or a timeline. The photos can also be shared through email and published through Blogger, an online personal diary, also provided free by Google, Inc.

ePortfolio is considered a Synchronous Collaboration Tool.

Picasa supports constructivist's method of instruction (a) collaborative learning, by facilitating a forum for critiquing class work; and (b) course management, by providing tools for students to electronically gather, organize, and display the artifacts of their learning collected over time. Picasa supports constructivist's conditions for instruction (a) ownership in learning, by providing time in the curriculum allotted specifically for portfolio development; and (b) social negation, as an extension of the face to face collaboration. Picasa supports constructivist's learning goals (a) critical thinking, with "virtual critical thinking" applications such as customization and presentation of their best projects; and (b) self regulation, with teachers allowing learners to use the portfolio to complete their course work; and (c) mindful reflection, by reviewing their thinking around the selected works, revisiting and revising their opinions, and identifying gaps and mistakes (Cohn, & Hibbits, 2004; Driscoll, 2005).

### Pros

The portfolio is used for assessment of learning objectives. Instructor feedback can be integrated back into the portfolio and treated as an artifact. Instructional designers tell us that the process of constructing an e-portfolio stimulates students to engage in reflective thinking. New graduates will use e-portfolios to showcase their creativity and accomplishments, to gain an edge in the job market. According to Cohn and Hibbits, "Not surprisingly, university career placement centers regard the e-portfolio movement as an opportunity to link academic outcomes to the workplace (Cohn & Hibbits, 2004)."

#### Cons

The online portfolio manages the display of the artwork, not the quality. While the content of the portfolio may not be artistic in nature, ePortfolio software assumes that the user

has a basic knowledge of digital media and design. If the artwork is in a paper format, the student must be acquainted with scanning procedures to transform it into a digital format before it can be displayed. If the images need quality adjustments, the student must be acquainted with digital design.

# **Overall Evaluation**

An ideal ePortfolio system should allow flexible input, organization, retrieval, and display. These technology products allow users to visually track their progress and Picasa provides the students with the tools to cultivate a gallery of work for display. Its relationship with Google products and price make it an easy choice for inclusion in the curriculum.

#### Final Recommendations and Rationale

Recommendations are made to supplement LCC's course offerings by expanding the Graphic Arts curriculum. By adding online Photoshop and Dreamweaver classes, LCC offers the freedom to take advantage of virtual delivery. This freedom should be appreciated by both students and teachers. For the student, it offers the access to class information and continue with class assignments anytime of the day. For the teacher, it offers the ability to communicate with students 24/7 and to view student's assignments online at their convenience.

Adding graphic art classes also take advantage of the patron's interest in the World Wide Web and their interest in exploiting all its features.

The virtual classroom is an excellent opportunity for LCC to enhance its visibility.

# **Implementation Plan**

Implementation of the virtual classroom should follow a procedure that insures the quality of design and instruction. The quality of the instructional design should meet the same

standards as face to face classes. The learning environments should be designed to motivate the students and ensure learning outcomes. The National Education Association (NEA) offers guidelines for the implementation of online classes.

The teacher should be skilled in the subject matter, learning theories, and technologies appropriate for the content area and the online environment. The curriculum should be relevant and challenging. The instructional design of the online courses should fully realize the advantages of online collaborative learning mainly by encouraging students to interact with each other. The students should be actively engaged in the learning process and interact on a regular basis with the teacher and online classmates. Regular assessment should provide students to reflect on the quality of their work. Support systems should provide resources to teachers, students, and parents comparable to those provided by face-to-face courses, as well as special support necessitated by the unique circumstances of the online environment. The technical infrastructure should provide the necessary tools for instruction and interactivity (NEA, 2006).

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# Table 1

Enrollment statistics

Enrollment	Number	Percentage
Full-Time	2,588	(39.4%)
Part-Time	3,976	(60.6%)
Female	4,040	(61.5%)
Male	2,524	(38.5%)
Minority	978	(14.9%)
Total Enrollment	6,564	(100%)

# Table 2

Number of Degrees conferred in 2005

Degrees Conferred	Number	%
Associate in Arts	211	(30.1%)
Associate in Science	26	(3.7%)
Associate in Applied Science	290	(41.6%)
Certificate Programs	93	(13.3%)
Specialized Credit Diploma	79	(11.3%)

# Table 3

Number of Faculty and Staff at Luddite Community College, Fall 2005

Faculty and Staff	Number	Percentage
Full-Time Faculty	108	(8.5%)
Full-Time Administrative Staff	70	(5.5%)
Full-Time Classified Staff	74	(5.8%)
Full-Time Special Term Staff	16	(1.3%)
Part-Time Faculty	381	(30%)
Part-Time Administrative Staff	13	(1%)
Part-Time Classified Staff	55	(4.3%)
Part-Time Community Service Staff	546	(43%)
Part-Time Special Term Staff	6	(.5%)
All Faculty and Staff	1,269	(100%)

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