

# Student Satisfaction and Perceived Learning with On-line Courses - Principles and Examples from the SUNY Learning Network

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### DRAFT

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The SUNY Learning Network (SLN) is the on-line instructional program created for the sixty-four colleges and nearly 400,000 students of the State University of New York. The foundation of the program is freedom from schedule and location constraints for our faculty and students. The primary goals of the SUNY Learning Network are to bring SUNY's diverse and high-quality instructional programs within the reach of learners everywhere and to be the best provider of asynchronous instruction for learners in New York State and beyond.

We believe that these goals *cannot* be achieved unless learning effectiveness is given top priority. This paper will examine factors that have contributed to the high levels of learning and learner satisfaction that students have reported in the SUNY Learning Network. The analysis will be done on several levels. This first section will look at the SLN at a program-wide level and will provide information regarding the systemic implementation of our asynchronous learning environment.

The second section examines issues that contribute to learning effectiveness from a faculty- development and course-design perspective. This section will present the evolution of the four-stage faculty development process and a seven-step course design process that was developed by SLN and comment on lessons learned.

The third section presents results from the SLN Student Satisfaction Survey conducted in the Spring of 1999. This section examines factors from a quantitative analysis that significantly contribute to perceived learning and student satisfaction in on-line asynchronous courses and offers recommendations for course and program design based on these factors.

The fourth section examines learning effectiveness at the level of individual institutions with examples from specific courses. This section will introduce the reader to local implementation of SLN courses at two colleges programs in the SUNY system, the Curriculum Design and Instructional Technology program at the University at Albany, and the Internet Academy of Herkimer County Community College. These case studies present and examine important evidence relevant to learning effectiveness from a single-institution and individual-faculty perspective.

With generous support from the Alfred P. Sloan Foundation combined with enthusiasm and resources from SUNY System Administration and participating campuses, the SLN has successfully met the challenges of the initial developmental phases that focused on "proof of concept" and "expansion/scalability". The annual growth in courses, from eight in 1995-96 to 1000 in 1999-2000, and annual growth in enrollment, from 119 in 1995-1996 to over 10,000 in 1999-2000, illustrates that the project has far exceeded the original projections.

The SUNY Learning Network started as a regional project in the Mid-Hudson Valley involving eight SUNY campuses. At that time the development and delivery of asynchronous courses was a new activity for SUNY campuses and faculty. The first courses were offered in the 1995-1996 academic year.

Successful experiences led to an expanded vision and goals for the SLN and the scope and objectives of the project have grown substantially. Where we originally developed courses at the 3rd and 4th year level - which were offered by two of our institutions, we are now offering courses at all undergraduate levels as well as the graduate level and forty-two of our institutions are involved. Our initial developmental phase focused on "proof of concept" within the SUNY System. This was followed by a phase that focused on "proof of scalability" which achieved significant growth in course offerings and student enrollments. SUNY's efforts continue to evolve the SLN from a "project status" to a fully integrated virtual learning component responsive to the needs of learners in the new millennium. Ultimately, the SUNY Learning Network will represent the entire State University of New York through the creation of one virtual campus that will be open 7 days a week, 24 hours a day to students across the globe.

The SUNY Learning Network primary mission is to bring SUNY's high quality instructional programs within reach of learners anywhere. Another objective of SLN has been to take an efficient approach in supporting the SUNY campuses. Rather than each campus reinventing the wheel, SLN has developed and implemented the appropriate operational services and support yielding both cost savings as well as the sharing of experience from one campus to another.

SLN has traditionally assisted campuses to conduct individual course evaluations. Additionally, the SLN Office conducted two program-level student surveys and one faculty survey during the 1998-1999 academic year. The goal of the student surveys were to gauge the level of student satisfaction with SLN, perceived learning with SLN, and what factors contributed to those results. The results of this survey are presented in this paper.

## Background Information for Program

Prior to the SLN program, many SUNY campuses were starting to experiment with asynchronous components to compliment their classroom-based courses. In addition, some SUNY campuses were taking regional approaches to utilizing synchronous two-way videoconference and some satellite broadcast forms of distance learning courses. SLN has been unique in SUNY in that it has been a unifying effort for all SUNY campuses to participate in the same single-system program for ALN.

SLN is not a replacement for the classroom – it is another choice for students and is therefore open to all students. Students that participate in SLN range in age from 16 to 70+. They are both traditional students as well as returning adults. Most students have not taken an on-line course before and report that they have average or high computer skills. Completion rates vary by course and faculty member, just like they do in classroom-based courses. An analysis for on-line course completion rates compared to classroom completion rates is included in the individual case study by University at Albany professor, Karen Swan.

The enrollments in the SLN continue to grow dramatically. In 1995-1996 SLN had 119 enrollments. This grew to over 6000 enrollments in 1998-1999. We anticipate doubling every year for the next three years.

## Method

The technical infrastructure for SLN has evolved over the past five years. When SLN started there were no course management systems so we developed our own utilizing the industry standard for collaborative computing, Lotus Notes. Since we have started we have enjoyed the advances of Lotus Domino and the ability to operate on multiple Intel based Windows NT servers at the same time – a tremendous advantage over other commercial packages. When a server goes down, all of the courses are on all of the other servers so students and faculty can continue in this teaching and learning experience. This infrastructure was developed, implemented, and operated by SLN for the first 4 years of the program. During the past year another system wide support center has begun to provide server management support while SLN maintains application and program management. SLN has built common applications and processes so that there is consistency for students from the different campuses. For example, students can use a single username and password to gain access to all of the courses they are taking.

The delivery of SLN Courses is through a web browser so students enjoy text, graphics, and other media depending on the course. SLN has tried to keep in mind the balance required by slower Internet access capabilities that our students may have in their home. It is also important to note that our on-line courses do not require that every learning activity is web based. Faculty may utilize other software applications, simulations, videotapes, other non-computer-based media, and other non-technology based activities. An example of such "offline" activities might be a student observing a local kindergarten classroom for a Child Psychology and Development course.

Students participate as a cohort and start and end the course according to the calendar of the campus offering the course. Participation is asynchronous throughout the course but it is not self-paced. Most courses have very strong discussion components and faculty have placed a great deal of value in this area. Faculty have been very creative in developing and adjusting their approaches to student assessment. Many instructors have implemented on-line test and quizzes but often this has been used for student self-assessment. There have not been any mandatory synchronous requirements in the courses. A few faculty have had some optional real time activities and certainly an on campus student that wants to visit a professor during office hours would not be turned away.

In SLN, the faculty member is ultimately responsible for course development. Our initial experiences have led us to believe that the person teaching the course should also develop the course so that they have a complete understanding of the course and how it functions. SLN, and now a few campuses, provide instructional design support for the faculty member. This assistance is part of a well-organized and structured faculty development process. There are face-to-face, hands-on training workshops, remote support, and technical support seven days a week through the SLN Help Desk, as well as print and web-based resources.

Initially the program allocated some compensation from our Sloan grant to the campuses to provide to the faculty in addition to a laptop computer. This is the exception for some selected sponsored degree programs and the local campus handles the majority of individual courses. Some campuses have instituted local approaches to faculty compensation that varies.

The next section examines factors that contribute to learning effectiveness from a faculty development and course design perspective.

## Introduction

The SUNY Learning Network has developed a course design process to help faculty create instructionally and technically robust learning environments in which to teach and learn. We began the development of our course design process with sound instructional design principles and an existing understanding of distance learning and computer-mediated instruction. Working with hundreds of SUNY SLN faculty and students we have now refined our understanding of on-line teaching and learning and provide our faculty with a comprehensive instructional model that has a sound framework to guide the design of on-line asynchronous courses. This section will detail our course design process and what we have learned is effective in the design of asynchronous learning environments.

## Background

Beginning in 1994, traditional faculty were hired to create on-line courses for asynchronous delivery into the home via computer. Each faculty member worked with an instructional design partner to implement the course. From the fall of 1995 through spring of 1997, forty courses were developed and delivered, and the instructional designer conducted interviews, collected empirical data, and made observations.

## Rationale

Our objective has always been to develop faculty to teach on-line, and at the same time insure that they create consistent and effective courses within a specific, limited time frame. This required us to implement a scaleable and replicable process to train large numbers of faculty to produce technically and instructionally sound courses according to what we have learned works best in the design of on-line instruction. Following more than 400 faculty through their full course development and delivery cycles has enabled us to gather a comprehensive understanding of what works in an on-line teaching/learning environment. Our course design process was synthesized from that understanding. Our comprehensive and integrated faculty development and course design processes are the cornerstones of this program and a significant component of our success.

Our processes and our understanding in this area have been evolutionary in nature. Access to large numbers of faculty, courses, and students has been a significant factor in our ability to synthesize a general understanding of effective on-line teaching and learning, and course design. We are able to collect data, evaluate, and revise specific elements of our program to reflect our growing understanding. All our faculty and course design resources and services reflect our current findings and are refined as our understanding grows. The information and understanding we have is explicitly designed into the template application that we created, and is outlined in detail in our course developer handbook. This information is also communicated to new faculty through our trainings, support, and on-line resources.

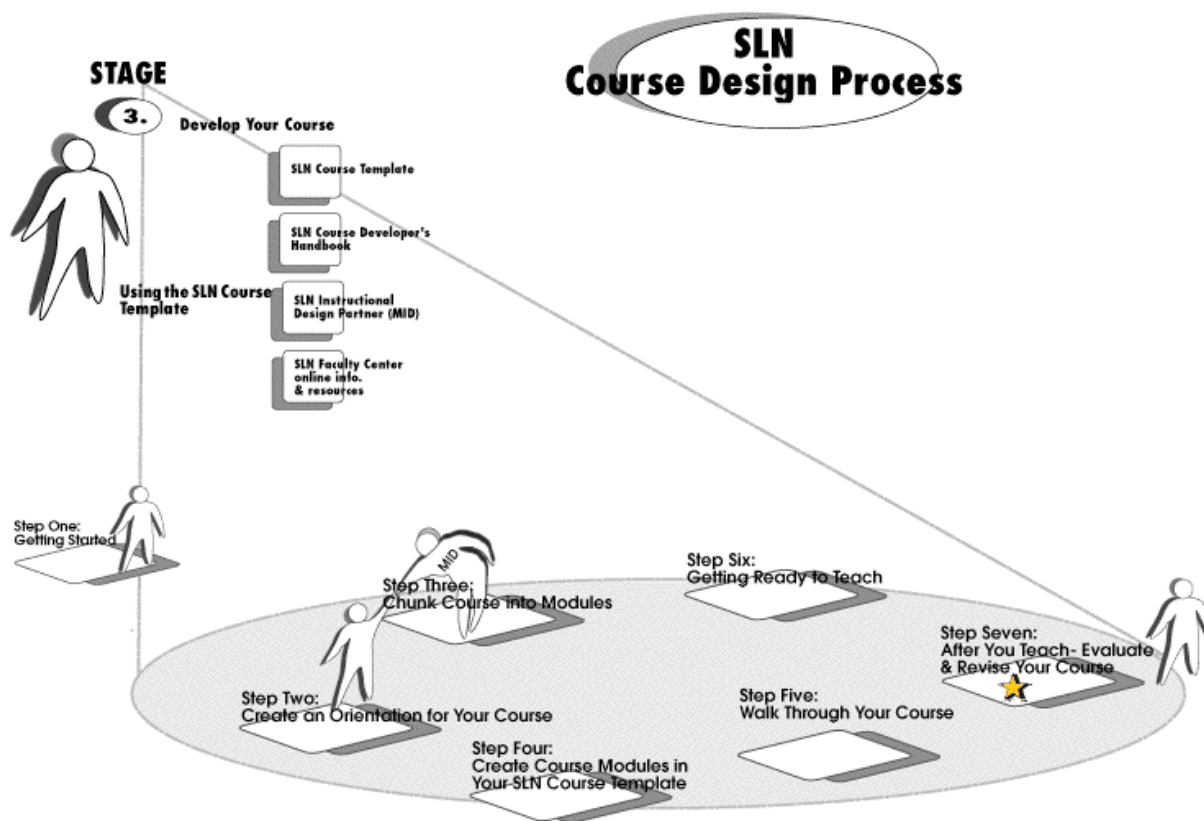
We quickly learned that faculty needed guidance and help understanding the options and limitations of this new type of classroom. The need for the multimedia instructional design partner (MID) of our program emerged from our direct work with faculty. We have learned that developing effective on-line instructors and instruction have both technical and instructional aspects that are not necessarily intuitive or analogous to the traditional classroom. For example, there are technical hardware and software issues that require on-going support in working with faculty. The majority of our faculty require some kind of technical support and training. Training was required and developed specifically for our program and the applications developed in-house for both faculty and students targeted point-and-click level users. It was clear from the beginning that all faculty required one-on-one support in addition to any group training or documentation they received. The role of the Multimedia Instructional Design partner (MID) evolved to support faculty during their early development with our applications and to help them develop a firm understanding of the options and limitations of this new classroom.

The MID helps faculty to design courses and learning activities in a manner consistent with our growing knowledge of best practices. They also help instructors to fully understand the limitations students face with potentially slow, remote access and its implications for effective course design. The need to apply a consistent structure to the chunks of a course, and the need to provide detailed explanations, and consistent and redundant instructional cues for students throughout course documents could only be achieved consistently and on a large scale by the MID working one-on-one with faculty. Helping faculty complete the development of their on-line course prior to the first day of class is another challenge and reason for the role of the MID in the course development process. Without them to insure that faculty fully develop the materials and activities and test the functionality of their courses, we would not have a consistent way to insure technically and instructionally sound courses.

We recommend that courses be complete on the day the course starts for several reasons. A complete course gives students the sense of the course as a whole. A stable environment with a consistent design and redundant instructional cues must be designed and tested. This

can't happen on the fly. Common complaints from faculty include that students will work ahead in the class, or that imposing this constraint prevents the spontaneity or flexibility that exists in the traditional classroom. In the same way that classroom students will rarely read ahead in a book or begin assignments in advance, we have learned that on-line students rarely work ahead of the pace set by the instructor. The advantage to students is that, with the course structure complete, they can get a sense of the topic and of the scope of the activities they will be doing in much the same way as browsing through the course syllabus, or leafing through the chapters of a book. We have also learned that the way to insure a flexible on-line classroom is to pre-design a consistent course module structure that contains explanations and shell documents that can accommodate the interests of the students, the spontaneity of the instructor, or that can incorporate current events. A complete course will also allow faculty to concentrate on teaching and managing the course and participating fully with the students, rather than trying to plan the next lesson, or checking functionality.

## The SLN Course Design Process



## Method

To begin the process, we ask faculty to think about the development of their course as a conversion of what they normally do in their traditional classroom, rather than a re-creation. Conversion requires that they "rethink" their learning activities and objectives within the context of the electronic asynchronous learning environment -- its options and resources, as well as its limitations, and that they then redesign how they will meet their instructional objectives and how they will assess learning.

For new SLN faculty the first stage in their development as on-line instructors is to get on-line and access the SLN Faculty Developer Gateway (<http://SLN.suny.edu/developer>) There they are introduced to the SLN faculty development and course design processes. They participate in a facilitated on-line conference to network with our growing community of on-line instructors, and to get the feel for on-line discussion in the asynchronous web environment. In Stage Two faculty begin to conceptualize their course and complete an on-line

orientation to the web course environment and they also have the opportunity to observe a variety of live on-line courses to help them get the look and feel of the on-line classroom. Stage Three is the SLN Course Development. They are asked to attend three workshops. At the first workshop, faculty receive a customized course template created in Lotus Notes, access to our networked system, and a step by step guide for building the components of their course. They are also assigned an instructional design partner (MID) to work with them throughout their first course development and delivery cycles and have access to a helpdesk for technology support.

## Course Development Process

### Step 1: Get Started

Before beginning work in their course template to design their course, we recommend that faculty begin to visualize their course in an asynchronous on-line environment. We ask that they assess their current instructional practices and relate them to distance learning principles. We ask them to reflect on what they do in the classroom compared to what they imagine doing in the on-line version of their course. We help them to identify some learning activities and methods of evaluation appropriate to asynchronous learning. We also ask that they draft a profile of their course. Much of the conceptual work in designing their course and our current understandings of effective course design are built into this stage of course development.

#### Reflection and Conceptualization

We have found that successful courses begin with faculty that can effectively articulate a description of their course. Using a narrative, conversational tone, we ask faculty to prepare a profile of their course that responds to these questions as though a student has asked them: *What will I get out of taking this course? What is this study about? How is this course organized? What exactly will I be doing when I take this course? How will you assess my work? What constitutes "good" work in the course?*

We ask faculty to make their profile "user friendly," by writing their responses as though addressing a single student. With this we begin to shift faculty from thinking about addressing a classroom of students toward addressing the individual on-line student sitting alone in front of a computer interacting with their on-line course materials and activities. We have found that well-articulated answers to these questions become the foundation for the actual course information and orientation documents that are necessary for students to be well oriented and welcomed into an on-line classroom.

We then ask faculty to document the details of their course including any prerequisites for participation, such as additional software or special hardware or other media or tools, if guest speakers will participate, etc. This step begins to alert faculty to the planning necessary in setting up their course. Prerequisites must be documented in advance in order to insure that students come to the course prepared and that the technology can accommodate the instructor's plans.

### Step 2: Create an Orientation

We have found certain specific orientation information effective to introduce the student to the on-line. A student that is well oriented to the instructor, the course, and the instructor's expectations, will have fewer questions and will feel more comfortable in the on-line classroom. We have identified nine orientation documents that give students "walls" to their on-line classroom. The purposes of orientation documents are to cover the range of initial information students may need to become familiar with the instructor, the course, and general course-related information. They are:

1. **Welcome**  
Introduces the instructor and the course to the students. We ask faculty to think of it as a letter of introduction. It sets the tone, and is the students' first "glimpse" of the instructor.
2. **Contact Information**  
Details specific information about the course, how to contact the instructor, and the instructor's schedule.
3. **Course Overview & Objectives**  
Describes the course and course objectives in greater detail.
4. **Readings and Materials**  
Details the texts and/or materials to be used in the course. Can list optional/additional reading materials or resources for course.
5. **Course Learning Activities**

Describes specifically each type of activity that the students will be doing during the course.

6. **How you will be evaluated**  
Details specifically how each activity will be evaluated.
7. **My Expectations**  
Details specifically what the instructor expects from students in terms of participation in the class and/or any other specific expectations the instructor may have for students in their class.
8. **Course Schedule**  
Clearly outlines every activity the student needs to do in the instructor's course including reading assignments, assignment due dates, scheduled tests and quizzes, special projects, discussions, group activities. Titles and references to documents and modules in the course must be consistent for the schedule to be effective.
9. **Next Steps**  
Some of the next tasks a student should do might include reading any posted announcements, posting a personal profile, participating in an ice-breaking discussion, etc.

### Step 3: Chunk the course into Modules

In designing the modules of a course the instructor's pedagogical approach, the nature of the content or discipline, and the constraints and features of the on-line asynchronous environment determine how an instructor will "chunk" his course. We suggest that faculty look at their content, consider how they want to teach it, and see if chunks naturally emerge. We also recommend that faculty look at examples of how others have "chunked" their courses.

This is the most important and most difficult step for faculty. It is important, we have found, to allow faculty to create their own course materials and determine the structure of their course. Faculty must have ownership of and investment in their own course, and ultimately the ability to teach and manage the course without relying on support.

### Step 4: Create learning activities in your course modules

Just as the instructor's pedagogical objectives, the nature of their content, their personal style, and the features and constraints of the web shaped the module structure of their course, so too will they shape the section structure and specific learning activities for their course.

We ask faculty to:

1. List the learning activities that they envision for each of their modules. They then draft a name or title for each activity.
2. Do they foresee students working through the learning activities in a specific order? If so, they draft the list of the learning activities in that order. If not, list them in a logical order for each module.
3. Does a pattern of activities emerge? For example, activities may logically group by topic, task, or date. Grouping the activities in a logical and consistent scheme across modules will help the instructor enhance and organize course materials and activities. Consistency in the structure and order of activities across modules also helps students in their understanding and navigation of the course, materials, and activities.

The instructor then creates a draft name for each learning activity that is descriptive and unambiguous. We recommend that they keep the titles short and to the point. And, that they consider putting due dates, type of task, and a descriptive name in the title. We recommend the use of consistent naming conventions across modules and for similar types of activities.

Once the instructor has decided on the general module framework for their course, their task is to plan out their learning activities within each module. At this stage sequencing and consistency will be very important. A well-designed course will be consistent and logical in its presentation and organization. For example, a typical module could begin with an overview, followed by some introductory material or lecture. Students are then typically given tasks, such as a reading in a textbook, creating a written assignment, and/or participating in an on-line discussion, or directed to complete some on-line or offline project or activity. We ask the instructor to consider the **sequence** of the learning activities for each module, the **quantity** of the learning activities for each module, and the **pacing** of the learning activities for each module.

## Navigation

Faculty also need to think about how their students will interact with their materials and navigate their course. Any course management tool will have built-in navigational buttons and a web interface that facilitates students' navigation through all the levels of web screens. However, an instructor must not assume their students will know what to do and where to go next. Faculty will need to create navigational documents and instructions on their documents that explicitly tell their students where to go next and what to do.

For maximum effectiveness of navigational instructions, they should be consistent. We recommend that they use the same font, put them in the same location on pages, and use consistent wording for the instructions. Instructors can also use the section title and the document title to highlight a type of task, a due date, or a time frame.

## Evaluation

As part of this step we also ask faculty to consider carefully how they evaluate students. Timed multiple-choice tests for example can't be proctored in this environment. Nor can students be observed in person to ascertain certain skills. Working in this environment may require creativity and the design of new evaluation methods.

At this stage we ask faculty to:

- Review the list of learning activities that they created and take a moment to think about how they plan to assess or evaluate student work, performance, or learning for each activity.
- Look at the evaluation document they created in their syllabus and orientation area. Have they assigned appropriate values to the types of activities in their course? Do they match the actual activities they have planned? For example, is discussion 60% of the course and only 25% of the grade?
- How will they evaluate discussion, if it is a component of their course?
- Review the workload for students and for themselves. How many students are they likely to have? What if they have a very small number of enrollments? What if they have a very large number of enrollments? Will the activities they are planning still work? What alternatives do they have?
- Give some thought to workload and course management. The more students know about the tasks, activities, expectations, requirements and how they will be evaluated, the more comfortable and confident they will be participating in the course and the better able the instructor will be to manage the course.

An Instructional Design Intensive workshop during this step helps faculty identify instructional and technical solutions to create the learning activities in their course and effectively achieve the instructional objectives they have for their course.

## Step 5: Walk through the course

An integral part of the design stage of the course development process is the evaluation and revision of the course modules as the instructor develops them. If possible and time permits, they may want to have an outside reviewer such as colleague or expert in the field, and/or an instructional designer review their course. Reviewers can give very valuable feedback about issues such as content accuracy, technical quality, and functionality, user acceptability and usability, and issues associated with actually implementing and using the instruction. The SLN MID is responsible for this review and we provide a series of technical and instructional "preflight" checklists to facilitate this process.

Whether a reviewer is used, or not, it is important for faculty to evaluate and revise or refine the structure, materials, and activities they are designing during the development phase of their course. The checklists we provide have been designed to help faculty and our MIDs to evaluate, review, and pinpoint areas in their course in need of revision or further development. A "Teaching and Managing your Course" workshop at the end of this step marks the transition from the development phase to the course delivery phase. Technical and instructional issues are addressed and we provide a roundtable opportunity for new faculty to meet experienced faculty to discuss their on-line teaching. Giving the experienced group the chance to share their tips, strategies, recommendations and to allay and fears or concerns new faculty has been very effective and well received by new faculty.

## Step 6: Getting ready to teach

We provide our SLN faculty with a number of recommendations and tips for getting off to a good start. At the beginning of the semester, we encourage faculty to encourage all students to get familiar with the web environment for their course. We suggest having a few warm-up activities designed in the first module to get every one to know each other and to practice using the features specific to the web class environment. This allows students to practice doing the kinds of activities they will be doing in the course, and can be designed to "break the ice," i.e. introduce the course and the participants in the course to each other, and practice certain activities. It also begins to support a sense of class community, something we have found to be a very important part of an effective on-line learning environment. In order to keep the class moving we recommend that the instructor make sure that there is something "new" for the students at least every two to three days. If students are not moving the discussion along, the instructor might call on specific students to clarify a particular view, or to provide support for a view, comment on existing responses, and invite students to respond again. Or, put a note in the announcements area encouraging students to participate. If some students continue to remain silent, the instructor can send individual students a "prodding" email message. (Faculty need to keep in mind that there may be something preventing a student's participation such as, a trip, illness, technical difficulties, etc.)

### Course Management Tips

- Faculty should log in to their course on a scheduled basis - especially frequently at the beginning of the semester. Students will be wondering "who is out there" and the instructor can help them by responding right away. This gives students a sense of security and lets them know everything is functioning correctly.
- Faculty should respond to all student email immediately. Email should only be used for private communication between student and instructor. If the message is not private in nature instructors should ask the student to post it in the appropriate place in the course.
- Faculty should check for and respond immediately to any student queries in the course itself.
- Faculty should grade and return evaluated assignments to students as quickly as possible.
- Faculty should check to see that students are responding in the appropriate locations in the course and address any problems that may arise immediately. Keeping a course tidy and free from problems, false starts, or empty student documents created by accident keeps the "classroom" running smoothly, cleanly, and free of potential sources of confusion.

## Step 7: After you teach--Evaluate and revise your course

In anticipation of this evaluation and revision stage of the course development process, we encourage faculty to keep notes during the teaching phase of their course. Notes on any issues or problems that emerge for them as they teach, or that are commented on by students can help in the evaluation and revision of their course. Thoughts, general or specific, on the design, structure, pacing, and/or sequencing of the course, or of any of their activities should be documented as the course is taught.

This is the last step in the course developer process. Once an instructor concludes the teaching phase of their course they should evaluate the course and their experience and review the notes they made as they taught to assess any improvements and revisions necessary to the structure or activities in their course.

We ask faculty to think about what worked well? What didn't? Why? What could be improved? How? Were discussions successful? Were assignments and other activities successful? Were students able to complete all the modules in the course? Did most students complete the course? How was the workload for the instructor and for the students? Was the instructor able to keep up? Was there anything missing? Were there any points in the course where students did not do an activity, or did not understand the activity? The checklists we provide to our faculty can be used again in this stage to guide or focus summative evaluations of the course materials.

## Conclusion

### What we've learned and what we know

On-line courses are, by nature, learner-centered and can have more active participation by all students in the class than in a traditional classroom. Without the structure of weekly classes, students are generally expected to take a more active role in their own learning. A fundamental difference is that instead of simply showing up to make their presence known, in an on-line class students must "do" something, for example submit an assignment, ask a question, participate in a discussion, etc. Opportunities for these interactions with the course materials, with the instructor, and with other students must be designed into the on-line classroom.

On-line courses differ from traditional classroom courses in several ways. Since students don't have non-verbal cues, or the ability to raise a hand to ask questions, learning activities, instructions, and writing must be clear. Faculty must "assume nothing" and anticipate and address student questions. Faculty that are able to assume the perspective of the student as they design their courses and activities are better able to be sensitive to these issues and to create effective on-line learning environments for their students.

We have learned that an effective learning environment consists of well-organized and complete orientation and syllabus information that begin a course and are essential to help orient the students to the course, the instructor, and to what will be expected. In the design of course materials faculty need to pay special attention to the "tone" of their writing, and consistency in their module structure, document naming conventions, and instructional cues. Explicit orientations to each module with due dates, time frames, and details about what the module contains, as well as redundant, clear, explicit expectations and instructions are necessary to insure students are at all times well oriented to the content, activities, and tasks in the course. Faculty should design and create as many possibilities for student interaction as possible, both with the instructor and with others in the class.

Our large-scale production required that we develop ways to train large numbers of faculty and produce large numbers of courses of consistent quality. Using the MIDs, we avoid cookie cutter mass production by working with individual faculty and allowing them and their content to drive the design of their courses. And, we have the opportunity to influence and share best practices across the design of all courses by the same method.

We provide faculty with abundant tips, recommendations, checklists, best practices, examples, observations, and guidelines on what we know works. Included are lists of things to think about when teaching in an on-line environment, tips for making web course materials clearer and more effective, "Do's" for successful web page presentation, and tips on getting off to a good start. We have compiled lists of tips for effective facilitation of class discussion, course management tips to keep students engaged, and how to deal with inactive students.

## SLN Best Practices

The following are examples of some of the course design recommendations that we use:

- Create a non-graded ice-breaking activity in the first module of the course. Using the mechanisms for conducting an on-line discussion in your course, ask students why they took the course. This will help everyone get to know each other. It provides an opportunity to practice and model a good on-line discussion, and students who enroll late, or have technical difficulties, will not be so far behind.
- Encourage a sense of class community and build opportunities for interaction with the instructor and with other students in the course.
- Consider using a self-test the first week of class as a comprehension check on the orientation and syllabus documents for your course. This can make sure that students read that information and eliminate questions later on in the course. It also introduces the testing capability to students in a less threatening way.
- Create navigational instructions that explicitly tell students where to go next and what to do. Don't assume students will know where to go and what to do next, or for example, what is meant by "discussion."
- Long documents can be broken up into several shorter documents. A good rule of thumb is to not exceed 4-5 screens for scrolling. On long documents the instructor can inform the student at the top of the page: **You may want to print this out for easier reading.**
- Use heads, subheads, hypertext, and a document hierarchy to break up long paragraphs. But don't break them up so much that it affects the flow or meaning.
- Put important information at the beginning of a document.
- Use short descriptive titles for document subjects and Module names. Long titles don't fit well on the screen, and they lose their purpose. Indicate the type of assignment, due dates, or time frames in the subject lines or Module names and use them consistently throughout your course.
- Use directives, first person, and a friendly conversational tone. Avoid using the third person voice. This personalizes the course for the student.
- Don't **overuse** hypertext to link your course pages or to link to other web sites.
- Spell check work.
- Consider creating a prepared welcome email message that can be forwarded to students as they appear in the course over the course of the first week.
- Consider sending out an introductory letter to students that specifies the first off line reading assignments for the first couple of weeks. If they have technical problems they can do the initial reading, know what they should be preparing, and not be so far behind when they finally get on-line. Instructors may also want to design the activities in their course for the first couple of weeks with this in mind.

## Effective Navigation

We have found the following strategies effective in making sure students will be able to successfully and efficiently navigate the pages and activities in an on-line course.

### **Create instructional documents.**

Instructors should create documents that set up the directions and expectations they have for their various learning activities. This helps avoid confusion.

### **Create and use instructional cues.**

Instructional cues are the instructions and directions that explicitly help students navigate the pages of the course and learning activities efficiently. Instructions are very important in an asynchronous learning environment. Students need to know what to do, where, when, and how. And they need to be able to access information quickly and without difficulty to avoid distraction. For example, if an instructor wants the students to go to the **Discussion Area** of a course and to respond to a discussion question, they have to tell them to do that and tell them how.

### **Use Module, section, and document titles to organize and convey information about the activities, content and structure of your course.**

The module, section, and document titles present the organization of the course and all its activities. For purposes of clarity, faculty should consider using titles to specify the type of activity, due date, time frame, etc. The more information that can be put in this framework that the students see from the module view, the more comfortable and confident students will be with what they are to do.

### **Refer to the Course Navigation bars, links, and buttons.**

Course pages on the web will have a navigation bar and links to help students navigate and interact with the pages of the course. Faculty should encourage students to use them by referring to them with instructional cues on their content pages.

### **Make information accessible.**

If students have to travel too far to find what they need in their course by having to click too many successive documents or scrolling through very long documents, there is a risk of disorienting and discouraging them. The structure created by descriptively-named and well-categorized documents/learning activities also makes an on-line course more accessible.

### **Limit the number of hypertext links per page.**

If there are links to web sites outside the course area, make sure students are aware they are leaving and know how to get back. Create links to other modules or to other areas within a module only if necessary. Because of the nature of hypertext it is important to make sure students understand where they are and where their documents are going when creating responses and interacting with your learning activities.

## Final Notes

Based on our recent surveys we know that faculty and students are very satisfied with the SLN program and with on-line teaching and learning in general. The two best indicators for the success of our faculty development and course design process are that our SLN faculty and students persist in our program, and are willing to recommend it to their colleagues and other students. Using our process, faculty development, and course design and delivery can be done on a large scale and with consistency in the quality of the teaching experience and environment developed for faculty, and the learning experience and environment designed for students.

The next section presents results from the spring 1999 Student Satisfaction Survey as well as recommendations based on the results.

## Results of the Spring, 1999 Student Satisfaction Survey

In the Spring of 1999, students enrolled in the SUNY Learning Network completed a survey that may be useful in understanding questions related to learning effectiveness in asynchronous on-line courses. In all 1406 students completed the survey, which represents approximately 42% of enrollees for the Spring 1999 semester. The results that stand out most clearly for Learner Effectiveness are:

1. Interaction with the teacher is the most significant contributor to perceived learning in these on-line courses. Students who reported the highest levels of interaction with the teacher also reported the highest levels of perceived learning in the course.

### Student Ratings of Learning by Interaction with Teacher

How much did you learn?

Interaction with Teacher	Mean	N	Std. Deviation
A great deal	1.2916	439	.4842
Sufficient	1.6653	744	.6201
Insufficient	2.4490	196	.7795
None	2.1852	27	.8338
Total	1.6679	1406	.7128

Note: For this section all rating for perceived learning are based on a Likert scale: 1= I learned more than I expected, 2= I learned as much as expected, 3= I learned less than I expected, 4= I learned nothing

ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	188.979	3	62.993	168.251	.000
* Interaction with Teacher	Within Groups	524.908	1402	.374		
	Total	713.887	1405			

1. Students who reported that they participated in their on-line classes at higher levels than in the regular classroom also reported the highest levels of perceived learning.

### Perceived Learning by Level of Participation

How much did you learn?

Participation compared to classroom	Mean	N	Std. Deviation
Much higher	1.3039	283	.5453
Higher	1.5086	350	.6367
The same	1.7076	489	.6389
Lower	2.1585	284	.7838
Total	1.6679	1406	.7128

**ANOVA Table**

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	115.495	3	38.498	90.200	.000
* Participation compared to classroom	Within Groups	598.392	1402	.427		
	Total	713.887	1405			

2. Interaction with classmates is a significant contributor to perceived learning in on-line courses as well. Students who reported the highest levels of interaction with classmates also reported the highest levels of perceived learning in the course.

**Perceived Learning by Interaction with Classmates**

How much did you learn?

Interaction with classmates	Mean	N	Std. Deviation
A great deal	1.4000	285	.6005
Sufficient	1.6074	787	.6516
Insufficient	2.0708	226	.7799
None	1.9722	108	.8141
Total	1.6679	1406	.7128

**ANOVA Table**

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	70.026	3	23.342	50.827	.000
* Interaction with classmates	Within Groups	643.861	1402	.459		
	Total	713.887	1405			

3. Students who reported the highest levels of satisfaction with the Help Desk also reported significantly higher levels of learning than students who rated their satisfaction with the Help Desk as lower. Also, students who reported that technical difficulties impeded their learning reported significantly less learning over all than students who did not report that technical difficulties impeded their learning.

**Student Ratings of Learning by Satisfaction with the Helpdesk**

How much did you learn?

Satisfaction with Helpdesk	Mean	N	Std. Deviation
Very satisfied	1.4341	387	.6130
Satisfied	1.7170	530	.6757
Not very satisfied	2.1034	29	.6732
Not at all	2.8333	12	1.0299
Not Applicable	1.7522	448	.7560
Total	1.6679	1406	.7128

**ANOVA Table**

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	47.416	4	11.854	24.918	.000
* Satisfaction with Helpdesk	Within Groups	666.471	1401	.476		
	Total	713.887	1405			

**Student Ratings of Learning by Technical Difficulties**

How much did you learn?

Technical Difficulties	Mean	N	Std. Deviation
No technical difficulties	1.5962	634	.6682
Technical difficulties did not affect my learning	1.4943	350	.6138
No more difficult than classroom	1.7398	196	.6859
Somewhat more difficult	1.9540	174	.7814
Much more difficult	2.4808	52	.8743
Total	1.6679	1406	.7128

**ANOVA Table**

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	63.425	4	15.856	34.152	.000
* Technical Difficulties	Within Groups	650.462	1401	.464		
	Total	713.887	1405			

- The students' motivation for taking the course appears to play an important role in perceived learning. Students who reported that they were taking the course because it was not offered on campus reported significantly lower levels of learning that students who were taking the course because of family responsibilities or because of a conflict with their personal schedule.

**Student Ratings of Learning by Reason for Taking the Course**

How much did you learn?

Why did you take an online course	Mean	N	Std. Deviation
Distance or lack of transport	1.6087	161	.6908
Conflicts with personal schedule	1.6510	533	.6925
Course not offered offline	1.8187	182	.7972
Family responsibilities	1.5681	213	.7212
Interest in Technology/Internet	1.7279	136	.7249
Other	1.6906	181	.6611
Total	1.6679	1406	.7128

**ANOVA Table**

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	7.560	5	1.512	2.997	.011
* Why did you take an online course	Within Groups	706.327	1400	.505		
Total		713.887	1405			

6) Gender appears to play an interesting role in on-line learning. Women reported higher levels of perceived learning than did men.

**Student Ratings of Learning by Gender**

How much did you learn?

Gender	Mean	N	Std. Deviation
Female	1.6183	938	.7093
Male	1.7671	468	.7103
Total	1.6679	1406	.7128

**ANOVA Table**

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	6.909	1	6.909	13.721	.000
* Gender	Within Groups	706.978	1404	.504		
Total		713.887	1405			

7) Age may also play a part in perceived learning in on-line courses. The youngest students (16-25) reported that they learned the least and that they were the least satisfied with on-line learning. Students in the 36-45 year old range reported that they learned the most and were the most satisfied with on-line learning.

### Perceived Learning by Age Range

How much did you learn?

Age Range	Mean	N	Std. Deviation
16-25	1.8169	497	.7410
26-35	1.6269	394	.6956
36-45	1.5344	363	.6401
56-55	1.5634	142	.7192
56-65	2.0000	7	1.0000
65+	2.6667	3	.5774
Total	1.6679	1406	.7128

### ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig.
How much did you learn?	Between (Combined)	23.478	5	4.696	9.522	.000
* Age Range	Within Groups	690.409	1400	.493		
	Total	713.887	1405			

## Discussion and Instructional Design Implications

### Interaction with the teacher is the most significant contributor to perceived learning.

Students who do not have adequate access to their instructors feel they learn less. They are also less satisfied with their courses. These measures, while not precise indicators of learning effectiveness are, nonetheless, important in and of themselves. It would seem that, in terms of course design, those courses that include ample opportunity for student teacher interaction are preferable to those with limited or no interaction. In light of the importance of this variable, another important instructional design feature is the inclusion of documentation outlining reasonable expectations for teacher-student interaction. Clearly instructors cannot be available twenty-four hours a day or at the whim of the students. However, if the turn-around time on student requests for assistance is plainly communicated and consistently applied, student disappointment, anxiety and confusion can be reduced and satisfaction and learning can be increased.

1. **Students who reported that they participated in their on-line classes at higher levels than in the regular classroom also reported the highest levels of perceived learning.**

Opportunities for high levels of participation are an important course design feature for encouraging learning. Course designs that encourage equitable exchanges of ideas in which the contributions of all students are valued are preferable. Documentation that explains that participation is important and valued and which therefore encourages high levels of participation is another useful on-line design feature.

2. **Interaction with classmates is a significant contributor to perceived learning in on-line courses as well. Students who reported the highest levels of interaction with classmates also reported the highest levels of perceived learning in the course.**

Opportunity for interaction between classmates is another important course design feature. Documentation that explains that productive student collaboration will be valued in the course is one way to encourage such exchanges. Obviously, creating the forums for such collaboration is also necessary. The methods for building and maintaining student to student interaction require careful consideration and a good deal of facilitation, especially early in the course.

5. Students who reported the highest levels of satisfaction with the Help Desk also reported significantly higher levels of learning than students who rated their satisfaction with the Help Desk as lower. Also, students who reported that technical difficulties impeded their learning reported significantly less learning over all than students who did not report that technical difficulties impeded their learning.

Clearly, students feel that technical difficulties can and do impede their ability to learn. It therefore appears to be very important to provide some level of technical assistance to learners in this environment, especially for large programs such as SLN. A course design feature that can be recommended based on these results is documentation that encourages learners to seek help early, before they become so frustrated that they give up. It may also be useful to explain to students that on-line learning requires a certain degree of self-reliance and initiative that may exceed that required in the classroom.

**5) The students' motivation for taking the course appears to play an important role in perceived learning.** Students who reported that they were taking the course because it was not offered on campus reported significantly lower levels of learning than students who were taking the course because of family responsibilities or because of a conflict with their personal schedule.

This appears to be a difference between intrinsic and extrinsic motivation. Students who feel that the courses are beneficial because of the flexibility they offer in allowing the completion of goals that are otherwise prohibited may feel they are learning more than students who feel they must take the course because there is no other way to do so. Again, documentation regarding successful on-line learning strategies is useful in helping students decide whether this environment is for them.

**6) Gender appears to play an interesting role in on-line learning. Women reported higher levels of perceived learning than did men.**

This result is especially interesting in light of recent research that reports that in on-line learning (as in the classroom), "Males dominate the conversation, effectively silencing women." (Blum, 1999 p. 10). From our initial examination of the result of this survey (and a pilot survey) small but reliable differences exist suggesting that, women feel that they participate at higher levels than in the classroom, that they learn more, that technical difficulties are less likely to impede their learning, that they are more likely want to continue taking on -line courses, and finally, that they are more satisfied both with their specific courses at SUNY Learning Network and more satisfied with on-line learning in general than their male classmates. In summary, the on-line classroom appears to be a very female friendly place.

**7) Age may also play a part in perceived learning in on-line courses.** The youngest students (16-25) reported that they learned the least and that they were the least satisfied with on-line learning. Students in the 36-45 year old range reported that they learned the most and were the most satisfied with on-line learning.

Similar results were found in the pilot survey. It may be that age is an indicator of other important characteristics. Students who are attracted to and succeed in this form of learning tend to share certain traits. Generally speaking, they are voluntarily seeking further education, are motivated, have higher expectations, tend to be older and tend to possess a more serious attitude about their courses (CDLP, 1997). In some ways, age is a proxy for these attributes. Often, older students - especially those with familial obligations - are seeking further education out of necessity, either to keep a job or to get a better one. They tend to have higher expectations, more motivation and a more serious attitude for a number of reasons. If the courses are well designed, it is not unreasonable to expect these students to participate at higher levels, and to experience higher levels of satisfaction and learning because of their backgrounds. Once again, it is important to communicate what kinds of students tend to succeed in and enjoy on-line courses. While age is not in anyway a barrier, motivation and self-reliance may be even more important on-line than in the classroom.

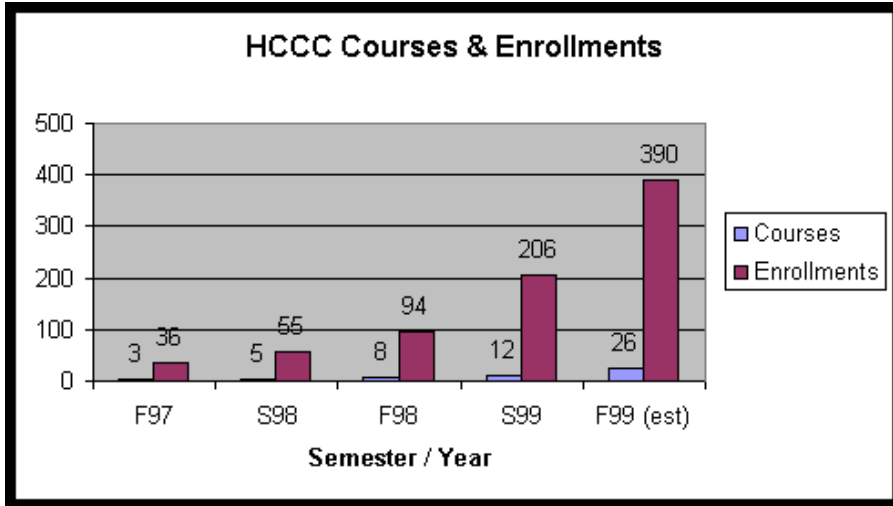
An interesting factor that does not seem to matter is reported computer ability level before the start of the course. In the Spring 1999 semester, as in the Fall 1998 semester, students prior computer skill level did not play a significant role in perceived learning. This seems especially curious inasmuch as students that reported that their learning was impeded by technical difficulties felt they learned significantly less than those who did not feel this way. Once again, the students with the least prior computer knowledge reported the highest levels of learning. Perhaps the most important implication of this finding - lack of prior computer knowledge does not seem to be a barrier to on-line learning.

The next section examines learning effectiveness at the level of individual institutions with examples from specific courses. This section will introduce local implementation of SLN courses at two colleges programs in the SUNY system, the Internet Academy of Herkimer County Community College, and the Curriculum Design and Instructional Technology program at the University at Albany. These case studies present and examine important evidence learning effectiveness from a single-institution and individual-faculty perspective.

## Introduction

This section will deal with the sequence of events leading to the formation of the Internet Academy (IA) at Herkimer County Community College (HCCC). HCCC is a medium sized (2500 students) two-year college located in upstate New York. In the Spring of 1997, HCCC decided to join with several other State University of New York (SUNY) colleges and participate in the SUNY Learning Network (SLN). The Academic Dean decided that HCCC would begin by offering Internet-based courses leading to the A.A.S. degree in Travel and Tourism, a program which HCCC has offered with great success for many years. In preparation for the Fall, 1997 semester, three courses were selected, three faculty members were recruited, and a campus support person was designated.

Table 1



.....  
Insert Table x about here. (Bill Sloan-HCCC.xls)  
.....

As seen in Table 1 the total Fall, 1997 enrollment was 36 students. The following semester, Spring, 1998, five SLN courses were offered, total enrollment was 55. In the Fall, 1998 semester we offered eight courses to 94 students, and in the Spring of 1999 there were 12 courses with 206 students. HCCC will offer 26 courses in the Fall of 1999, and anticipates approximately 390 students.

During the Spring of 1999, plans were made to expand the Internet-based courses into additional programs, and the Internet Academy grew out of this effort. The Internet Academy was inaugurated at a press conference on May 6, 1999. Students are currently able to get admitted to the college, register for courses, and complete all of the coursework in any one of six degree programs, all without ever visiting the campus. Plans are to expand this to ten degree programs in the Fall of 2000. Each program requires between 62 and 65 credits to complete. Course offerings will be programmed in such a way that a student may complete their degree program within two years.

The college maintains an Internet Academy website at <http://hccc.ntcnet.com/IA>.

## **Rationale**

The Internet Academy is thought of as a separate entity within the college. Although the Internet-based courses are scheduled concurrent with the on-campus course calendar, they are intended to appeal to students who find it difficult or impossible to travel to campus for their coursework. Participants in our Internet-based courses completed a survey during the Spring, 1999 semester. The data suggests that approximately 40 percent of our Internet-based course students would not be able to take the courses if they were required to attend classes on campus. Additionally, our data suggests that the most important reason why students take Internet-based courses is for "convenience. At HCCC, teaching effectiveness is monitored by the Associate Deans, who regularly observe classes. This same model was applied to the Internet-based classes - the Associate Deans observed professors as they participated in on-line discussions, graded papers, and conducted the routine tasks associated with on-line teaching. One of the Associate Deans now teaches an on-line course for the Internet Academy, and the other Associate Dean, who was somewhat skeptical initially, now expresses great enthusiasm for this approach.

Prior to Fall, 1997, there was no Internet-based instruction at HCCC. In fact, the Internet first became available on campus in the Fall of 1996. The individual who was designated as the support person for the SLN courses had been appointed Director of Learning Systems Technology (LST) in the Fall of 1997, and was primarily concerned with 2-way compressed video as the means of providing distant access to campus courses. Then in the Spring of 1999, at an all-faculty meeting, the president of HCCC, Dr. Ron Williams, suggested that we should begin thinking more globally about our Internet-based courses. He went so far as to proclaim his interest in creating "some kind of Internet Academy" with the goal of providing easy access to our programs for disabled and non-traditional learners. A short time later the Director of LST expressed an interest to Dr. Williams in pursuing the idea of an Internet Academy, and, with a tremendous amount of campus-wide cooperation and support, the Internet Academy now exists.

## **Method**

For the method section, this case study will focus on the professor at HCCC with the greatest amount of Internet teaching experience. Professor Pelz, the author of this section, taught two courses, Freshman Seminar (1 credit) and Introductory Psychology (3 credits) in the Fall, 1997 semester using courseware called TopClass. The courses were not offered via the SUNY Learning Network, but were hosted by SUNY on a SUNY server as part of a university-wide evaluation of TopClass. Introductory Psychology has subsequently been taught four times via the SUNY Learning Network using Lotus Notes, and the Freshman Seminar has been taught 2 more times, also using Notes. In addition, Professor Pelz has developed and taught Abnormal Psychology (twice) and Social Psychology (once). In addition to teaching over the Internet, Professor Pelz has taught Introductory Psychology and Social Psychology over a 2-way compressed video interactive synchronous network. Because of these experiences he is well positioned to offer opinions concerning courseware, technology and pedagogical issues.

### *Technology and Infrastructure:*

The courses were developed using either TopClass (1997) or Lotus Notes - with custom templates provided by SLN - (1998 - present). Of the two course management programs, Lotus Notes was the more mature product, and provided the most satisfying experience for both the students and the professor. To a large extent, the ease of use and pedagogical functionality of Lotus Notes is provided through the custom templates developed by SLN programmers. These templates enable the use of class discussions, small group exercises, self-tests and assignments with relative ease, and are flexible enough to allow each professor to exhibit his/her own style of interaction. Although the SLN courses are developed with Lotus Notes, they are viewed by students using their web browser. No special software is required. The

SLN templates provide a consistent look and feel to all of the courses, making the students task of mastering the technology much easier.

The infrastructure of servers is provided by SLN. Several servers (the number has grown over the years to 5) are maintained, and all of the course databases are replicated among these servers frequently. This system provides a great amount of redundancy, so that equipment failures almost never prohibit access to the courses. In addition to servers, SLN provides extensive training and support, both during course development and course administration. There has been no charge for these infrastructure services to date, but that looms as a future possibility.

#### *Course delivery:*

For all of the courses I have personally developed, the pace of the course is directed by me, not the student. The primary reason for this is to facilitate extensive discussion on course related topics. I have found that students are willing, many even eager, to discuss relevant, course-related topics asynchronously. The pedagogy I use requires each student to lead discussions on topics they select from the readings. The other students in the class are required to participate in these discussions by responding to "critical thinking" questions posed by the student discussion leaders. I permit each discussion to continue until it "self-extinguishes," and I interject my comments only as needed to facilitate the integrity and accuracy of the discussion. I attribute much of the student excitement and enthusiasm for my courses to this strategy. Additional methods include essay exams on the readings (which I treat as "take-home, open-book" exams) and web-based research papers, which require students to locate and sift through numerous web sites and make decisions on the value of the information they convey.

Student performance is assessed as follows: participation in discussions (quality of questions and responses as well as quantity of contributions) - 50%, essay exams on the content - 20%, and research papers - 30%. There are no synchronous activities required.

#### *Organization and Evolution:*

Course development is the responsibility of the professor. However, there is bountiful support from the SLN staff, and more recently from local campus expertise. The SLN staff conduct a series of workshops which new course developers are required to attend. In addition, there are separate workshops which experienced web-instruction faculty are encouraged to attend. There are three workshops for new faculty. They are conducted throughout New York State at sites convenient for all participants. The training begins about six months prior to the course going "live," and continues until the course begins. Support is not limited to the workshops. Each professor is assigned a Multimedia Instructional Design specialist (MID) who works with him/her on a one-to-one basis throughout the development cycle. Initially MIDs who work for SLN provide this service. But as campus participation grows, the campus is expected to provide this support locally. As an example, HCCC appointed Professor Pelz as campus MID when it was decided to launch the Internet Academy. It is expected that each campus will do this when the number of courses they offer reaches 15-20 per semester.

Additional support is provided by the SLN Help Desk. At any time, a faculty member can call or email the Help Desk to receive assistance in using the technology - such as server access, modem setup, email and file attachment issues etc. And this same Help Desk support is available to students in the courses.

A final support exists in the form of a Developer's Handbook. This reference provides step by step instructions and examples of the tasks required to develop and manage a course using Lotus Notes and the SLN templates. The Developer's Handbook is periodically updated, and is indexed for ease of use.

Herkimer County Community College has encouraged and facilitated faculty involvement in Internet-based instruction by providing a budget which addresses faculty needs. When a professor volunteers to develop an Internet-based course, and this is never required, they are provided with a computer and printer for their home - even if they already have a home system. In addition, they receive a stipend (approximately \$1000, dependent upon academic rank) for developing and teaching the course. Also, the college pays to have a second telephone line installed into the professor's house (up to \$200), and pays up to \$40 per month for telephone and Internet access. This year, the college also moved to provide a campus MID. Faculty travel expenses to SLN workshops are also provided by the college. In exchange, faculty agree to teach each course they develop a minimum of two times.

## **Results**

There are several performance indicators which address the issue of learning effectiveness.

Perceived learning by the participating students: Our Summer, 1999 survey results indicate that the majority (94%) of students who complete an Internet-based course believe that they learn as much or more as they would in a classroom-based course.

Completion rates: Results from the Spring, 1999 survey reveal that 82% of internet students complete their courses, and 78% of students taking the same courses in the classroom completed.

Comments which were often made on the student survey suggest that many students perceive the Internet-based courses to be harder than traditional classroom-based courses, yet 70% indicated that they will take more courses on the Internet, and 45% responded that they would like to do all of their coursework on the Internet.

The next section presents an overview of the on-line Curriculum Design and Instructional Technology Program at the University at Albany as well as a case study of courses in this program.

## **Learning Effectiveness of the University at Albany's**

### **On-line (SLN) Masters Degree Program in Instructional Technology**

#### **Introduction**

We began work on the on-line version of our masters degree in Instructional Technology in the spring of 1997. Judy Genshaft, the Vice-President of Academic Affairs at the University at Albany, brought together several members of my department, Educational Theory and Practice (ETAP), and asked us if we were interested in developing a program that would offer a masters degree entirely asynchronously. When we said yes, she introduced us to Eric Fredericksen.

Like most SUNY Learning Network (SLN) degree programs, ours was created from an existing face-to-face curriculum – the masters degree in Curriculum Design and Instructional Technology (CDIT). This program was designed both to meet the certification needs of practicing teachers in areas other than those covered by our secondary advanced certification programs, and to offer specialized training and retraining in curriculum, instruction, and the burgeoning field of educational technology. It was this latter discipline on which we choose to focus our attention, in part from a shared belief in design as a particularly important path to understanding. How could we pass up the chance to practice what we preach?

The CDIT degree is a 30 credit, 10 course, masters program, half of which is proscribed, half of which is designed by the student in consultation with his or her advisor. Proscribed courses include two educational foundations courses – one in human learning and one in social thought, a course in instruction, a course in either technology or curriculum, and a course in educational research. Enrollment in the CDIT program is open to any student with an undergraduate degree whose GPA is 3.0 or better. We agreed to develop and teach 10 web-based courses which would collectively satisfy the CDIT degree requirement. Our on-line courses, however, are open to all students in the CDIT program. Students may mix and match on-line and face-to-face courses to satisfy the degree requirements.

We offered our first on-line courses in the fall of 1997. The most technology literate among us were the first to jump. Carla Meskill created an on-line version of her *Language, Literacy and Technology* class. Joseph Bowman developed an on-line version of his web design course -- *Computing and Education II*. I put my introductory *Computing and Education I* course on-line; and there it stayed. It has been offered continuously (with Gas handling most of the workload) ever since. In the spring of 1998, Dr. Meskill and I collaborated on the on-line version of *Media in Teaching and Learning*. In the fall of 1998, we added *Systematic Design of Instruction* (taught by Robert Bangert-Drowns) to satisfy the instruction requirement and *Teaching in Context* (taught by Audrey Champagne) to satisfy the social thought requirement. In the spring of 1999, Ted Bredderman developed an on-line version of the required *Research Seminar*, and I recreated my *Mass Media and Education* course on-line. This coming fall we will add the last two courses necessary to completing the degree – Carla Meskill and Peter Shea are developing the introductory *Educational Research* in the SLN format, and Vic Kouba is mounting the last required course, *Learning in the Academic Disciplines*.

The intended audience for our on-line CDIT courses was people interested in instructional technology but separated in space from our face-to-face classes. We have found, however, that a large percentage of our traditional student population, practicing teachers, are very appreciative of the chance to complete at least some of their coursework asynchronously. They, it turns out, are often separated from our classes by time conflicts.

## **Rationale**

The primary motivating factors that led us to decide to develop an on-line masters degree program centered on the chance to experiment with the new medium. Many of us specialize, at least in part, in instructional technology. For us, then, course development was a learning as well as a teaching experience. On-line courses also allowed us to offer our students the opportunity to experience advanced educational technologies as they learned about them.

Although we would have liked to have outside evaluators assess the effectiveness of our on-line courses, no budget could be found for this undertaking. We had no specific goals to be met by the courses other than course objectives common to both on-line and face-to-face versions of the classes. On-line versions of our regular end-of-semester student evaluations were undertaken during the first year (two semesters) of our participation in the program, however. The results of these evaluations were slightly higher than those of the traditional versions of the classes. (See Figures 7 and 8.)

## **Background Information for the Course or Program**

There had been no completely asynchronous courses given at the University at Albany before we undertook them, although some very interesting mixed face-to-face and on-line courses had been created for Project Renaissance, and there had been a variety of experiments with satellite and two-way video distance learning. In fact, the SLN project was turned down by two other departments before we accepted it.

Students in the CDIT program have traditionally tended to be mostly newly hired teachers (from all disciplines including the secondary academic areas) who need to get a masters degree in five years to obtain permanent teaching certification. These are working professionals in their mid to late twenties. In recent years, we seem to have been getting more and more people wanting to make mid-life career changes and/or interested in instructional technology but not teaching. These students are older and often full time students.

This trend was accelerated with the introduction of the SLN program. At least 1/3 of the on-line students are mid-life working professionals in fields other than pre-college teaching who for various reasons want instructional technology courses and/or the masters degree. More than half of our on-line students are over 30 years old. Nearly two-thirds of our students are male (in contrast to traditional enrollments). If anything, these students have been better than usual (and our students have always been quite good). Eric Fredericksen, in fact, is one of them.

We were also surprised by how many of our traditional students – local teachers – flocked to the on-line courses to fulfill some of their degree requirements. They tell us that other obligations have made it difficult to attend even our usual one night a week offerings.

Currently about half of the students in our on-line courses have had no ALN experience before enrolling in our courses. The other half have taken one or more asynchronous courses, usually within our program. Forty-five percent of these students rank themselves as highly computer literate and another half consider themselves to possess intermediate computer skills. Thus, only 10% of the students currently enrolled in our on-line classes consider themselves computer novices. Distant students were more likely to be more computer/WWW experienced.

The completion rates for our on-line courses have been statistically similar to our face-to-face offerings. If anything, they have been slightly higher than usual. (Figures 1 and 2) Enrollments in the on-line courses are much higher than they had been in the face-to-face versions of the courses (See Figures 3 and 4), something we had not anticipated.

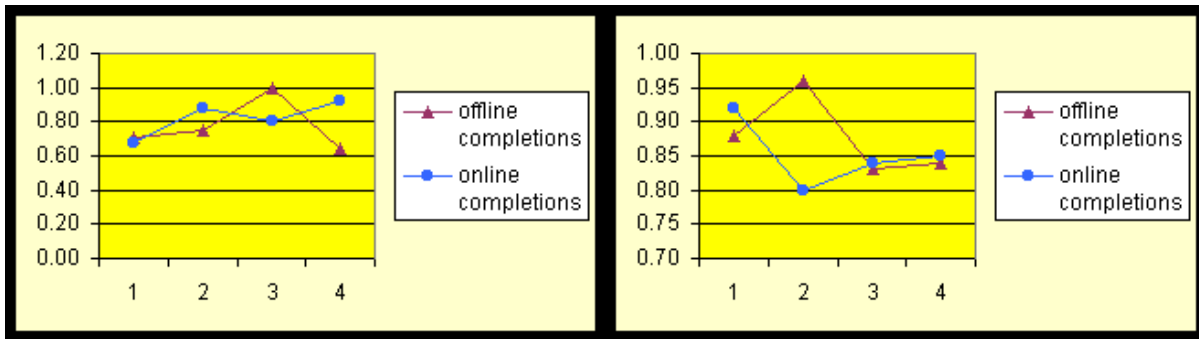


Figure 1

Comparison of Completion Rates for ETAP 426 and 526 (Computing in Education)

Traditional and On-line Versions

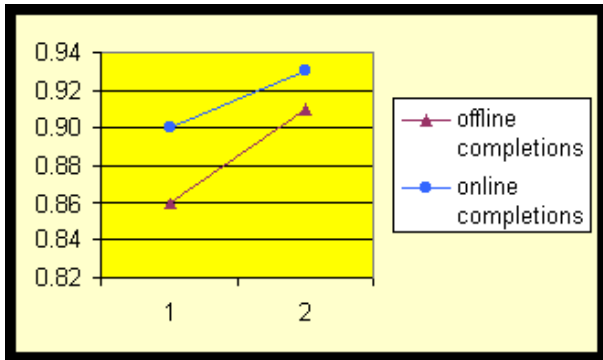


Figure 2

Comparison of Course Completions in Face-to-Face and On-line Versions

of ETAP 523 (Media in Teaching and Learning)

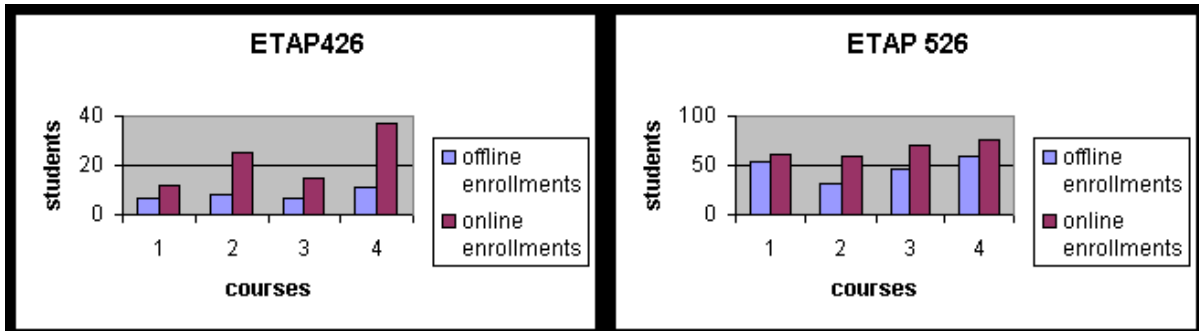


Figure 3

Comparison of Enrollments in ETAP 426 and 526 (Computing in Education)

Traditional and On-line Versions

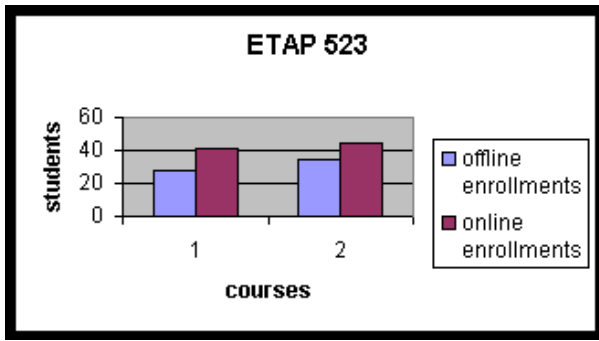


Figure 4

**Comparison of Traditional Enrollment in ETAP 523 (Media in Teaching and Learning) with Enrollment in On-line Version**

**Method**

**Technology & Infrastructure**

Our courses were developed in Lotus Notes using custom templates provided by SLN (designed to run on both PC and Macintosh platforms). The courses reside on multiple servers maintained by SLN. A decision was made at SLN to keep all courses as simple as possible so that they could be accessed by the greatest number of students. Our courses are therefore primarily text-based, although many of our courses (especially those concerned with media) do utilize graphic organizers and images.

**Content Delivery**

In this and the following section, I will focus on the courses I teach – Computing in Education I, Media in Teaching and Learning, and Mass Media and Education. These courses, as are all the courses in our program, are delivered according to our regular 14-week semester schedule. I do not insist (through grade reduction or other devices) on specific due dates for work in my classes, but students are strongly encouraged to keep up with assignments that are given on a weekly basis.

All of my courses are portfolio-based – students are given many small assignments of a variety of types (see below) which are assessed on a pass/fail basis for a set number of points. They just have to do it. Sometimes (rarely), I give extra points for especially good assignments and/or take off points for extremely poor assignments. I also allow students to redo poor assignments for full credit. Students in my courses are primarily assessed on the basis of written assignments, projects, and discussion. As I have become more familiar with asynchronous formats, I have come to put more of an emphasis on discussion. This is because I have been very impressed with the quality of on-line discussion. Indeed, I think this is one of the strongest features of asynchronous environments. For similar reasons, I have never used tests or quizzes -- I believe they are weakly implemented asynchronous formats. Figures 5 and 6 show the assessment schemas for two of my courses.

	TELECOM	TUTOR	TOOL	TUTEE	
READINGS	critique & summary	Critique & summary	Critique & summary	critique & summary	8 points
	(2 points)	(2 points)	(2 points)	(2 points)	
	email (3 pts)	5 software reviews	Wordprocess (3 pts)	Logo I (4 pts)	36 points

	eval criteria (3 pts)	(X 2 pts each =	data manip (3 pts)	Logo II (4 pts)	
<b>PRACTICUM</b>	web sites (3 pts)	10 points)	presentation (3 pts)	(or prog. evidence, 8 pts)	
	lesson plan	Lesson plan	lesson plan	lesson plan	16 points
<b>PROJECT</b>	(4 points)	(4 points)	(4 points)	(4 points)	
<b>DISCUSSION</b>	3 postings + 3 comments (X 1pt. each = 6 points)	3 postings + 3 comments (X 1pt. Each = 6 points)	3 postings + 3 comments (X 1pt. each = 6 points)	3 postings + 3 comments (X 1pt. each = 6 points)	24 points
<b>REFLECTION</b>	3 postings (X 1pt. each = 3 points)	3 postings (X 1pt. Each = 3 points)	3 postings (X 1pt. each = 3 points)	3 postings (X 1pt. each = 3 points)	12 points
	24 points	25 points	24 points	23 points	<b>96 points</b>

**Figure 5**

**Portfolio Assessment for ETAP 426/526 (Computing in Education)**

## MODULES

	Introduction	Mass Com.	Soc. Reality	News & Info.	Consumerism	Media Lit.	
<b>4 disc. Postings</b>	04	04	04	04	04	04	<b>24</b>
<b>@ 1 pt. ea.</b>							
<b>4 disc. Comments</b>	02	02	02	02	02	02	<b>12</b>
<b>@ 1/2 pt ea.</b>							
<b>1 construction</b>	(media log)	(analyses)	(TV critique)	(news comp.)	(posit. paper)	(lesson plan)	<b>24</b>
<b>@ 4 pts.</b>	04	04	04	04	04	04	
<b>2 const. comnts</b>		01	01	01	01	01	<b>05</b>
<b>@ 1/2 pt ea.</b>							
	10	11	11	11	11	11	<b>65</b>

## MEDIA OBSERVATIONS

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	
<b>1 obsrv.</b>	2	2	2	2	2	2	2	2	2	2	2	2	<b>24</b>
<b>@ 2 pts</b>													
<b>2 comnts</b>	1	1	1	1	1	1	1	1	1	1	1	1	<b>12</b>
<b>@ 1/2 pt ea.</b>													
	3	3	3	3	3	3	3	3	3	3	3	3	<b>36</b>

**TOTAL POSSIBLE POINTS = 101**

Figure 6

Portfolio Assessment for ETAP 522 (Mass Media and Education)

## **Organization and Evolution**

Faculty members have sole responsibility for implementing their courses on-line, but they are given lots of help (on an as needed basis) from SLN multimedia instructional designers (for instructional design issues) and help desk staff (for technical issues). Because our degree program is in instructional technology, we needed perhaps less help than typical faculty members, but it was/is there when we need(ed) it. Although local support was promised, it has been slow in coming.

ETAP faculty were given monetary stipends, course reduction, laptops, and a budget of \$1,000.00 for additional resources to develop and teach the SLN version of their course at least once. Monies came from the Sloan Foundation through SLN. Participation in the program was strictly voluntary. All courses were developed as on-line versions of face-to-face courses by the faculty members normally responsible for them.

My Computing in Education (ETAP 426/526) course has been offered four times. I taught the first two semesters of it. The last two semesters, enrollments have been so high that we have offered two sections taught by graduate assistants. This fall, we will offer three sections. I have changed the grading procedures somewhat over time, added new websites and readings, and revised the instructions to students. This fall I plan on a major change to one of the modules and the addition of overview sections to each.

Media in Teaching and Learning (ETAP 523) was developed by both Carla Meskill and myself. We co-taught it the first semester it was offered. I have taught it once on-line and once face-to-face since then. Although I did add a journaling activity and make major changes to the computing module in ETAP 523, it is interesting to note that I made more changes in my face-to-face teaching based on the on-line version of the course.

I have only taught Mass Media and Education once on-line, but it's development (as previously noted) was highly influenced by my experiences with the other two courses. In particular, I based the course mainly on the discussion of a series of (sometimes provocative) readings, and trusted my students to collectively construct meaning through this means. The only changes I anticipate making in this course are perhaps changes in the readings.

## **Results**

For the first two semesters we participated in SLN, we used on-line versions of the standard student evaluations usually given at the end of the semester. These Likert-type rankings ask students to agree or disagree (on a five-point scale with 5 representing "strongly agree") with two statements – "This course was excellent" and "This instructor was excellent." The evaluations are traditionally given with the instructor absent from the room. They are machine scored and give a total (averaged) rating for each course. The on-line versions were emailed to students and compiled by the SLN staff.

A comparison of evaluations for two courses for which this was done is given in Figures 7 and 8. The comparison is between student evaluations of the on-line versions of each course and student evaluations of the traditional version of the same course given in the preceding year. Student evaluations of the on-line versions of these courses were slightly higher but statistically similar to student evaluations of their traditional versions. Similarly, final grades in the on-line versions of these courses were slightly higher but statistically similar to the traditional versions of the same courses. (See Figure 9.) Finally, as previously noted (Figures 1 and 2), the completion rates for our on-line courses have also been slightly higher but statistically similar to our face-to-face offerings.

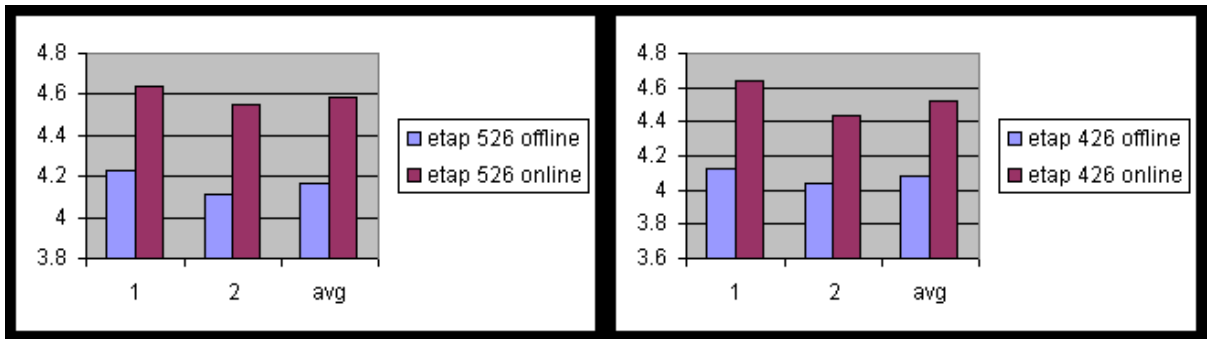
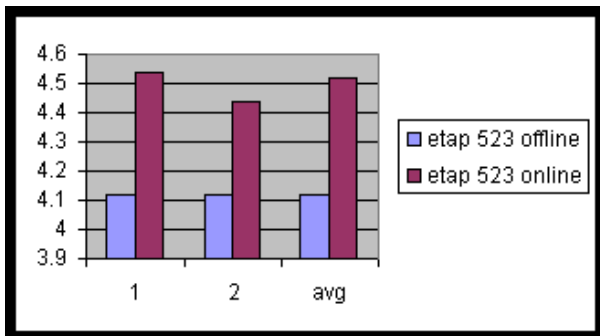


Figure 7



Comparison of Student Rankings for Traditional vs. On-line Versions of

ETAP 426/526

Figure 8

Comparison of Student Rankings for Traditional vs. On-line Versions of ETAP 523

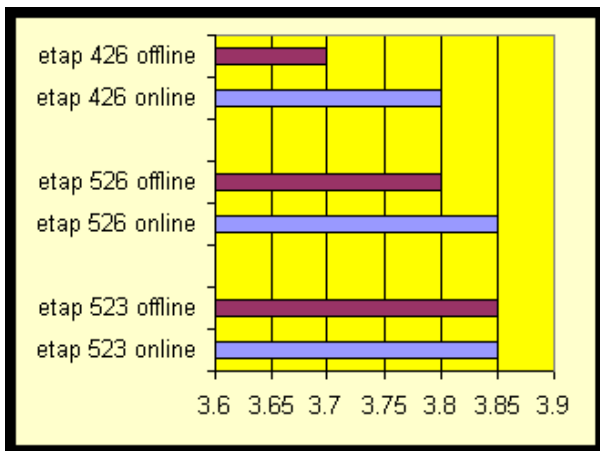


Figure 9

Comparison of Average Grades in Traditional (Spring '97) Vs On-line (Spring '98) Versions

of ETAP 426, ETAP 526, and ETAP 523

In my opinion, one of the critical factors for the success of on-line learning is the valuing of students by the instructors. This can take many forms. A particularly good example is on-line discussion. When on-line discussion is valued (graded), authentic (involves real questions), and frequent, when interactions are positive and enthusiastic, students learn more and are happier. Another way of valuing student performance is portfolio assessment. Portfolio assessment respects the learner and gives all students the chance to excel.

I think student/teacher and student/student interaction is also critical to successful on-line learning. Frequent, positive, and personal interactions can help bridge the communication gap created when face-to-face courses are moved on-line.