Student Satisfaction and Reported Learning in the SUNY Learning Network

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Abstract: In the Summer of 2001 students in the SUNY Learning Network completed surveys regarding their level of satisfaction and reported learning in an entirely on-line learning environment. A goal of the research was to relate student satisfaction and reported learning in the online environment to established principles of good practice in the "offline" environment. For the most recent term, data was collected from 935 students, adding to the largest ongoing study of on-line student attitudes to date, which includes responses from more than 8000 respondents over a five year period. Results again indicated that a number of variables were significantly correlated with high levels of satisfaction and perceived learning. These included the quantity and quality of interaction with the instructor and classmates, prompt and quality feedback from the instructor and the communication of clear expectations. The report includes an explanation of the results relative to social learning theory and established principles of good practice in higher education.

Review of Literature

Frequent reports in the popular media decry the lack of hard data on questions surrounding student attitudes and outcomes in internet based distance learning. This study was designed to provide such data, to determine how students who studied online felt about their courses, their learning performance in these courses, and to discover whether the most satisfied students shared any characteristics. These are not new questions and a large body of literature points to similar answers. Most of these studies conclude that, regardless of the technology used, distance learning courses compare favorably with classroom-based instruction and enjoy high student satisfaction. (Phipps, Merisotis, and O'Brien,1999): It has been reported however that research in the area of distance learning suffers from several weaknesses. Phipps, Merisotis, and O'Brien (1999) summarize these:

"…the methodology of many of the research designs is weak, with regard to such factors as the populations being compared or otherwise studied; the treatments being given, the statistical techniques being applied, and the validity, reliability, and generalizability of the data on which the conclusions are based." (Phipps, Merisotis, and O'Brien, 1999; p. 28)

Other areas of weakness identified by the authors are

> "A. The research has tended to emphasize student outcomes for individual courses rather than for a total academic program. B. The research does not take into account differences among students. C. The research does not adequately explain why the drop-out rates of distance learners are higher. D. The research does not take into consideration how the different learning styles of students relate to the use of particular technologies. E. The research focuses mostly on the impact of individual technologies rather than on the interaction of multiple technologies. F. The research does not include a theoretical or conceptual framework." (Phipps, Merisotis, and O'Brien, 1999; p. 11)

The authors conclude that although a great deal of research supports the notion that distance learning compares favorably to classroom based learning, the research is so weak that no clear conclusions can be made. While these criticisms cannot all be addressed by a single work, this study will attempt to account for many of these weaknesses. To address Phipps' et.al. first concern (A) this study will emphasize student attitudes not only for individual courses but also for the entire program represented by the

SUNY Learning Network. In all the data used in this and previous surveys represents more than 1000 instructors and courses and over 8000 students enrolled in more than 40 complete online degree programs. As such the data in this individual study and in this series of studies represents a very large sample without the weaknesses identified by analyses of students enrolled in individual courses. With a sample of this size it can reasonably be expected that a wide variety of students and learning styles will be represented thus accounting for some of the student differences in (B) and (D). Further, this study will look specifically at student differences such as age, gender, academic level etc. in an attempt to sort out how such differences affect student satisfaction and learning. Inasmuch as these courses utilized a wide variety of technologies (computers, audio, video, the Internet) it does not focus on a single technology as in (E). This study will also present a conceptual framework for understanding student satisfaction with online learning, accounting for (F).

Conceptual Framework

"*Learning, both outside and inside school, advances through collaborative social interaction and the social construction of knowledge*" (Brown, Collins & Duguid , 1989).

Learning has been defined most adequately as a social process (Vygotsky, 1962, 1978; Bruner, 1990; Brown, Collins & Duguid , 1989; Lave, 1988, 1990) and any learning environment that is meant to foster understanding must account for the social nature of the endeavor. If an overarching framework for understanding student's feelings about working in the relative isolation of a virtual classroom is to make sense, this framework must account for mechanisms that overcome such isolation. Students learning in a virtual environment can be expected to require several support mechanisms in order to feel satisfied and to learn. These include the support of the faculty, classmates, the administration of the environment, as well as the technology, and content. If faculty are trained to recognize the affordances and constraints of virtual learning environments, if students and instructors are offered a variety of support mechanisms for overcoming social isolation, if courses and course content are designed with an understanding of the requirements of learning at a distance, then it can be predicted that student satisfaction and learning will be relatively high. In the absence of these prerequisites students can be expected to experience confusion, frustration and isolation. A brief review of the faculty development, course design and student support processes is provided below.

When learning is viewed primarily as a social process a number of predictions can be made about student affect in virtual learning domains. An obvious hypothesis is that interaction between student and teacher and student and student will be of great importance. From this conceptual perspective one would hypothesize significant relationships between students satisfaction with levels of interaction with the instructor and fellow students and their overall satisfaction with the learning experience.

We believe that an existing body of literature also provides guidance for discovering principles of good pedagogy in online learning. They are the same principles of good practice that promote high levels of "offline" learning. When these principles of are

enacted in an asynchronous online environment, we have found that students report higher levels of learning and satisfaction.

We also look at survey results that show correlations between the nature of the SLN asynchronous, text-based online learning environments and student's reported: depth of thought in discussions, ability to communicate effectively in writing, feelings of isolation, time on task, and reported learning. We find good reason to believe that long-standing good instructional practice enacted in this environment engenders high levels of interaction, participation, satisfaction and learning.

Description of project

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 primary goals of the SUNY Learning Network are to bring SUNY's diverse, 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.

Strategic objectives for this initiative are threefold:

1. to provide increased, flexible access to higher education within and beyond New York State;
2. to provide a mechanism for maintaining consistently, high quality online teaching and learning across the SUNY system; and
3. leverage the resources of the State University of New York system to contain the costs associated with the development, design, and delivery of online education.

The SUNY Learning Network started as a regional project in the Mid-Hudson Valley involving eight SUNY campuses. Initially, the development and delivery of asynchronous courses was a new activity for SUNY campuses and faculty. With generous support from the Alfred P. Sloan Foundation combined with enthusiasm and resources from SUNY System Administration and participating campuses SLN successfully met the challenges of an early developmental phase that focused on “proof of concept” and “expansion - scalability”.

Successful experiences led to an expanded vision and goals for SLN and the scope and objectives of the project have grown substantially. The annual growth in courses, from eight in 1995-1996 to over 1500 in 2000-2001, and annual growth in enrollment, from 119 in 1995-1996 to over 25,000 in 2000-2001, with courses offered at all undergraduate and graduate levels from forty-seven of our institutions, illustrates that the project has met and in many ways exceeded original projections.

Faculty Development and Course Design

All faculty who participate in the SUNY Learning Network agree to participate in rigorous preparatory training, and receive ongoing support during the entire time they teach their courses, from the trainers, multimedia instructional designers and a faculty helpdesk. Faculty report a number of motivators for deciding to develop and teach an online course. In our most recent survey of faculty, with 255 respondents we found that most faculty chose to participate due to an interest in online teaching:

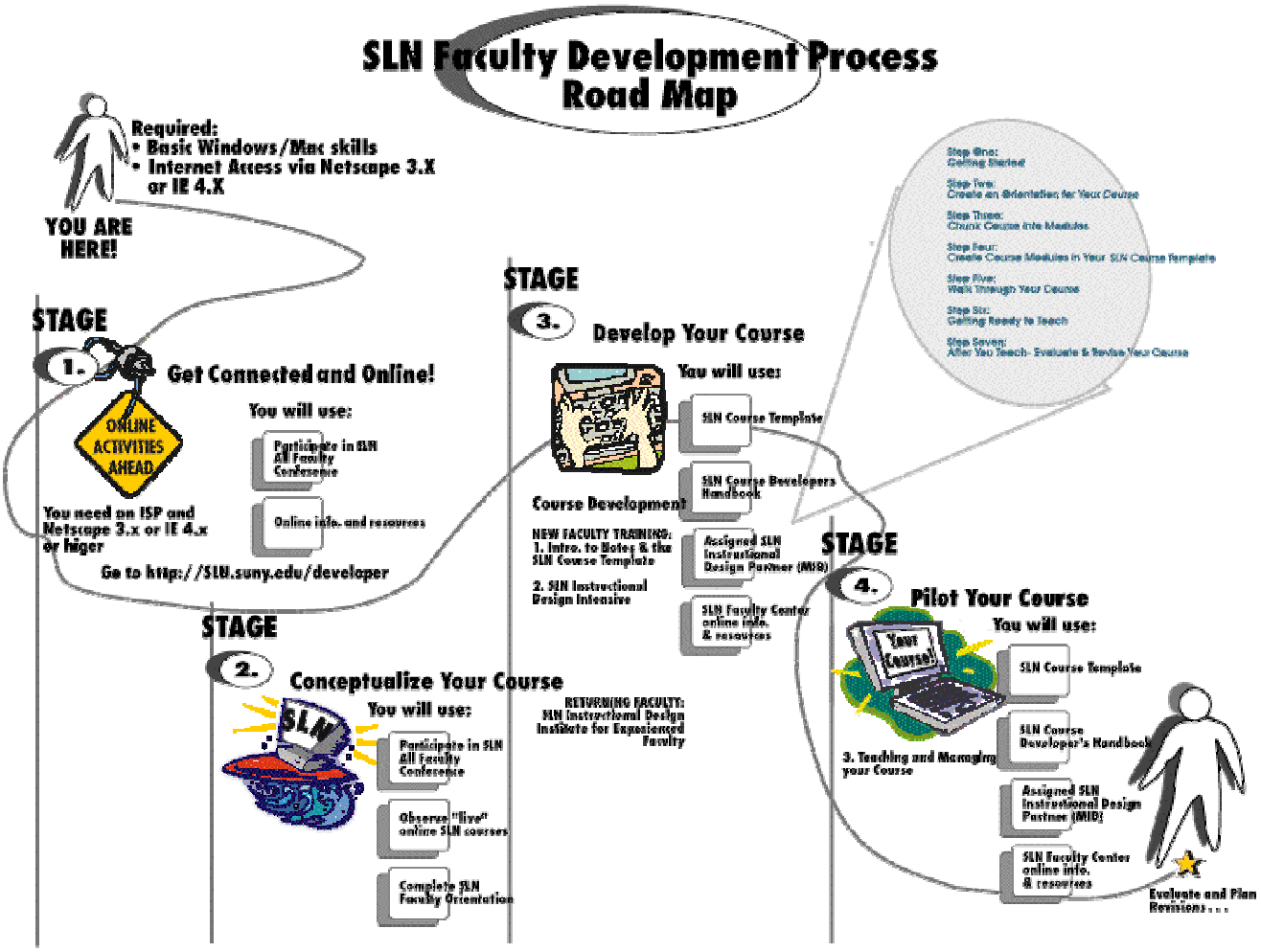
Table 1. Why did you choose to develop and teach and online course?

	Frequency	Percent	Cumulative Percent
Curiosity	17	6.7	6.7
Marketability of skills	14	5.5	12.2
Want/Need to telecommute	11	4.3	16.5
Course only offered online	4	1.6	18.0
Interest in technology/internet	22	8.6	26.7
Fear of being left behind	5	2.0	28.6
Interest in online teaching	152	59.6	88.2
Other	30	11.8	100.0
Total	255	100.0	

Training begins with participation in an online all-faculty conference which mirrors the environment in which faculty will eventually instruct. Through participation in this online conference new faculty come together to experience what they and their students will do in this new learning environment. The online conference helps faculty to understand, first-hand, the affordances and constraints of an online environment, allowing them to have the perspective of the online student. During this phase of the faculty development and course design process, new faculty also have the opportunity to observe "live" courses, examining and discussing the course designs and instructional styles of experienced SLN instructors in a variety of disciplines.

In addition to the online faculty conference new instructors also engage in twenty hours of face-to-face training. During three full-day trainings, implemented over an ongoing five-month synchronous and asynchronous training cycle, faculty receive a the comprehensives course development guide from which the example above is excerpted. Faculty continue to explore the idea that online instruction does not simply entail mimicking what happens in the classroom, but rather, requires a transformation. Common issues which arise include how to best create an environment in which students get to know the instructor, each other, and have ample opportunities for quality interaction and feedback. In order to fully exploit the unique opportunities of online instruction faculty are encouraged to reflect on their instructional goals and then to investigate, with the ongoing support of a multimedia instructional designer (MID), how best to translate and achieve those goal online. A faculty helpdesk provides continuous support to answer technical questions and make the technology as invisible as possible.

Direct support to faculty comes from a variety of sources. Faculty engage in a four-stage faculty development process and seven step course-design process before teaching online. This following graphic provides details of this process:



SLN Faculty Development and Course Design Process

Support to Faculty

Support provided to the faculty include the following:

People	Materials	Trainings	Software	Online Resources
SLN Administrative Team	Faculty Developers Handbook and Training Materials 1	Introduction to SLN	Lotus Notes	SLN Website
Instructional Design Partner and Trainers	Training Materials 2	Instructional Design Intensive	SLN Template	SLN Faculty Center
HelpDesk Staff	Training Materials 3	Teaching and Managing Your Online Course	MERLOT Discipline Specific Online Instructional Objects	All Faculty Conference
Experienced Faculty Mentors	Experienced Faculty Training Materials	Experienced Faculty Training	Advanced SLN Media Guide	Live Courses for Observation

SLN Support: People, Materials, Trainings, and Software

Course Design

Course design varies with instructional objectives, but all courses contain certain components deemed essential to good pedagogy both online and offline. Through our experience of working with more than 1000 faculty we discovered that given complete freedom to design a course, faculty often leave out components that students need in order to feel well oriented, to participate actively and to experience high levels of learning and satisfaction. So, we provide faculty with a shell structure, or course template, from which to begin the course development process. This template contains several components - 1) an orientation and syllabus section, 2) course module sections, where the ongoing course is enacted analogously to the classroom and 3) class community areas, where students can access the faculty member and other students outside of the "classroom". What follows is a more detailed description of each section that may help the reader to better understand this component of the faculty development process.

1) The Orientation and Syllabus section provides valuable information about the individual course. Here is a page from the faculty developers handbook that discusses this area and provides a rationale for each document type that appears in this section:

"A student that is well-oriented to you, your course, and your expectations, will have fewer questions and will feel comfortable in your online classroom. The purposes of Orientation and Syllabus document shells already in your SLN Course Template are to cover the range of initial information needs your students may have to become familiar with you, your course, and general course-related information.

Orientation and Syllabus documents:	**Purpose:**
WELCOME!	**Introduces you and the course to the students. Think of it as a letter of introduction. It sets the tone, and is the students' first "glimpse" of you.**
Contact Information	Details specific information about the course, how to contact you, and your schedule.
Course Overview & Objectives	Describes the course and course objectives in greater detail.
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.
Course Learning Activities	Describes specifically each type of activities that the students will be doing during the course.
How you will be Evaluated	Details specifically how each activity will be evaluated.
My Expectations	Details specifically what you expect from students in terms of participation in the class and/or any other specific expectations you may have for students in your class.
Course Schedule	Clearly outlines every activity the student needs to do in your course including reading assignments, assignment due dates, scheduled tests and quizzes, special projects, discussions, group activities. Titles and references to documents and module in your course must be referenced consistently for the schedule to be effective.
YOUR NEXT STEPS	This document is already written for you. It points the students to the Bulletin Board area of the course, directs the students to post a personal profile in the Meet Your Classmates area of the course, and then directs them to your first course module.

In this section of the handbook, numerous examples of each type of document are provided from courses in a broad range of disciplines. Faculty explore these suggestions and examples in face-to-face training and afterward as they develop their course during the five-month training cycle.

2) The Course Modules Area

A module is an area of the course that equates to a unit of instruction. Modules are, in some ways, analogous to the classroom. It is where most teaching and learning takes place in the course. How do faculty design these "chunks"? Another page from the SLN Faculty Development Guide:

"Your pedagogical approach, the nature of your content, and the constraints and features of the online asynchronous environment are what will determine how you "chunk" your course.

A. Look at your content, consider how you want to teach it, and see if chunks naturally emerge.

B. Look at examples of how others have "chunked" their courses. Depending on what is being taught and how the instructor teaches, the following are some examples of approaches to creating modules:

by content-specific topics

by chapters of a textbook you are using

by date or time frame

by a metaphor

by steps in a process

Or, any of these examples in combination. You may have some other way you would like to chunk your course."

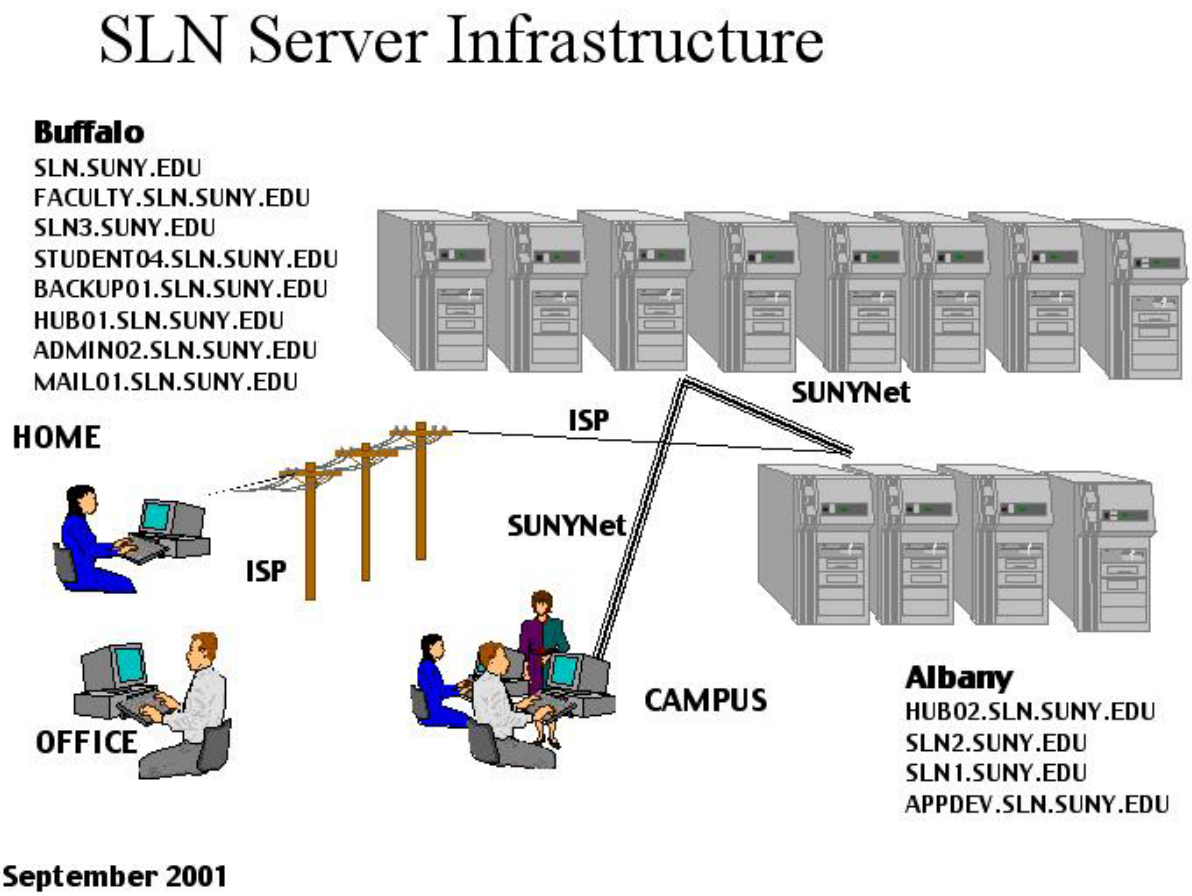
Again, in this section of the handbook, numerous examples of each type of module are provided from courses in a broad range of disciplines. Faculty explore these suggestions and examples in face-to-face training and afterward as they develop their course during the five-month training cycle. . Each module can contains areas for a module specific overview, lecture material, written assignments, whole class discussions, small group areas, tests and self tests, and student generated questions about misunderstanding they are experiencing. With the assistance of an instructional design partner, faculty create modules based on their own understanding of how best to meet their learning objectives

3) The Class Community Area- Ongoing research indicates the importance of interaction in online courses to sustain student engagement and learning. In response to results indicating the essential nature of community, the SLN Template was recently redesigned to include more explicit references to opportunities to interact. Components of the Class Community Area include the following sections: A) The Meet Your Class Mates Section - where students create their own profile and read the profiles of other students; B) The Bulletin Board Section - where students can interact with each other outside the "classroom" and read announcement and bulletins from both their classmates and the instructor; C) Online Office Hours Section - where students have additional opportunities to interact privately with an instructor. The section is subtitled "Talk to Your Professor"

to communicate as directly as possible, the availability of the faculty member for interaction with the student.

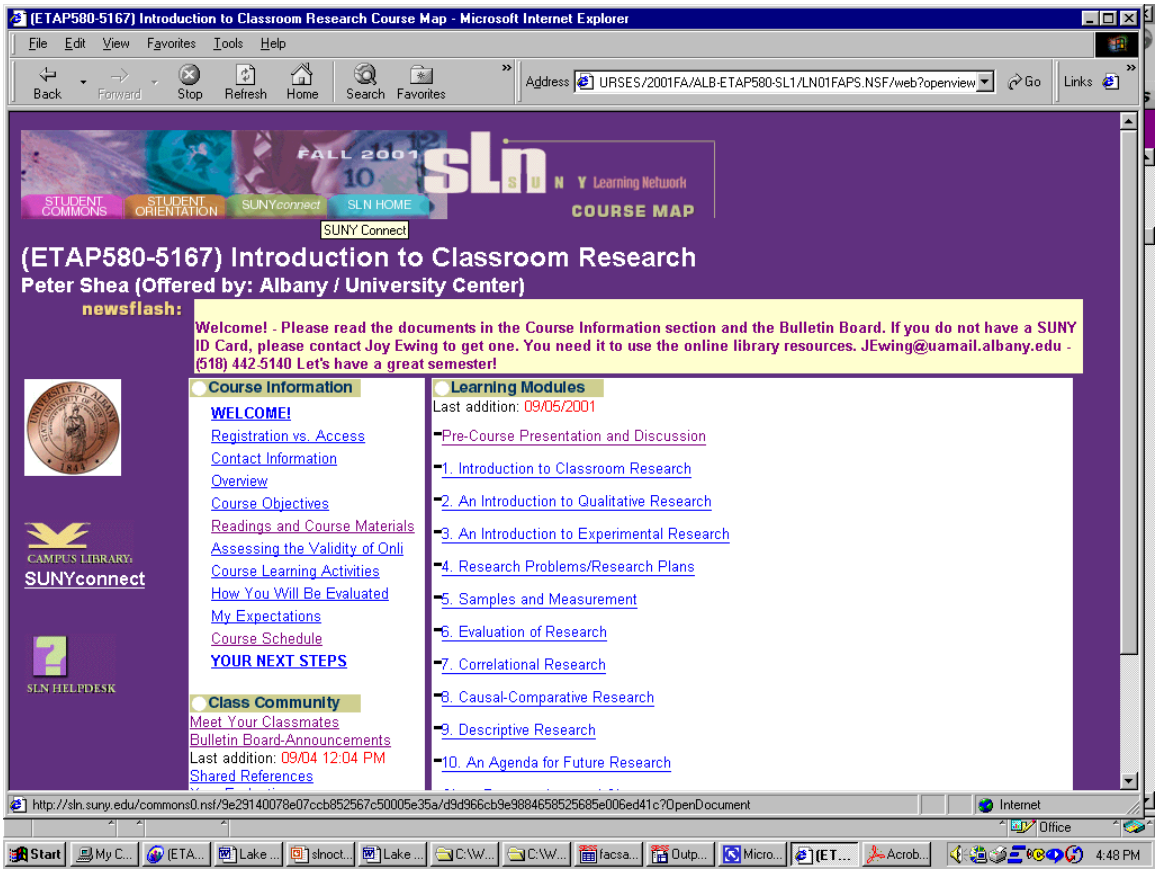
Technology and Infrastructure
Hardware and Software: Technical infrastructure is based on a redundant and highly available, multi-server, multi-location platform. Software, based on a flexible course template was locally developed in the Lotus/Domino Environment.

The following graphic provides additional information:



SLN Infrastructure

Courses
Courses may include text, images, sound and multimedia appropriate to meet course learning objectives. The image below is the new SLN Course Template interface, as seen from a students perspective on the web:



SLN Course Web Interface

Results

As part of the revision cycle of the course design and faculty development processes we have engaged in systematic efforts to evaluate and analyze online teaching and learning in SLN. Each semester we conduct comprehensive surveys of all participating faculty and students through an integrated, web-based data collection infrastructure.

Questions driving this assessment include - how do students who have taken online courses through SLN feel about the experience? For example - is there sufficient interaction with instructors and students to sustain learning? Do students feel there are any disadvantages to the online format relative to the classroom? For example, does the online format and pedagogy foster or inhibit thoughtful discussion of course topics, effective written communication or the likelihood that they will ask for help when they don't understand something? Are there other downsides, for example do these online students find that they waste time due to the distractions of the Internet and thus spend less time studying, or does the online environment make them feel isolated? Finally, how do students feel the environment compares to the classroom overall?

To assess whether this online learning environment has been successful from a student perspective it is necessary to remind ourselves what our "student" goals were. Some of these are outlined in the strategic objectives:

1. to provide increased, flexible access to higher education within and beyond New York State; and
2. to provide a mechanism for maintaining consistently high quality online teaching and learning across the SUNY system.

To determine whether and to what extent we were achieving these goals we implemented an online student satisfaction survey, which consisted of thirty-three questions. To define high quality teaching and learning in devising the survey, we used both socio-cognitive learning theory (Vygotsky, 1978; Brown, Collins, & Duguid, 1989; Lave, 1988; Bruner, 1990) and principles of good practices in higher education (Chickering & Gamson, 1987; Chickering & Ehrmann, 1995). Approximately one third of the questions we asked were based on the Current Student Inventory (CSI) developed by the Flashlight Program of the TLT Group. In the most recent survey (Summer 2001) we heard back from 935 students, about 26% of student enrollments for that period. The results of the student satisfaction surveys provide some indicators of whether SLN is providing increased flexible access and whether it provides high quality, online teaching and learning, and these indicators may prove useful to others working on systemic online learning initiatives.

Presented here are some very typical comments from the most recent survey of students in SLN which bear on the strategic goal of increased, flexible access and which indicate students' levels of satisfaction:

"*Online courses have literally changed my life. Working fulltime I was unable to continue my college education due to schedule conflicts until the SUNY Learning Network. SLN has made it possible for me to realize a dream by finishing my college education!!!"*

"This was my first online course; therefore it was a little awkward at first. My job responsibilities this semester required more travel than normal; taking this class online was a blessing. I worked from Florida and Texas while attending training for work."

"For people who have a less than traditional work schedule; an on-line course is the way to go. This being my first on-line course; it was a good experience; worked well into my daily schedule and I believe I learned more than I would have in the classroom setting. Once the stress of a traditional attendance schedule is removed; a much more relaxed atmosphere for learning is created by the ability to sign on and learn during the time frame that fits an individual schedule."

"I love online courses. They have given me the ability to juggle family; career and school. If it weren't for online courses; I would have never gone back to school....THANK YOU!!! :)"

Similar positive student responses, collected over the past six semesters testify to some measure of success and student satisfaction in the strategic area.

Other student demographics that correlates with satisfaction, and which bear upon increased access are distance and "busyness" In semester surveys of SLN students in which we ask students about their level of satisfaction with the SLN program we consistently find significantly higher levels of satisfaction from those farthest from campus. It can reasonably be expected that these are the students least likely to have traditional access to the education afforded by SLN. Higher levels of satisfaction are also found among students who report that they are taking courses due to family and personal conflicts which keep them from going to a physical campus, which, again, represent constraints on access. The tables below, based on the most recent sample of 935 SLN students, studying in the Summer of 2001, suggest the importance of increased access on student satisfaction. The scores are based on a likert-type scale with 1 being highly satisfied and 5 being highly dissatisfied and are in response to the questions "How satisfied are you with the SUNY Learning Network? and "Why did you decide to take this course online rather than in the classroom? "

Table 1 Satisfaction with the SLN Program by Distance from Campus

DISTANCE	Mean	N	Std. Deviation
On campus	2.09	11	.70
Less than 30 minutes	1.53	389	.66
30 minutes to 1 hour	1.59	214	.68
1 hour - 2 hours	1.57	112	.74
More than 2 hours	1.43	209	.59
Total	1.53	935	.66

Table 2 ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Satisfaction by Distance	Between Groups	(Combined)	6.566	4	1.642	3.796	.005
	Within Groups		402.123	930	.432		
	Total		408.689	934			

Table 3 Satisfaction with SUNY Learning Network by Distance

Why Online?	Mean	N	Std. Deviation
Distance or lack of transportation	1.45	128	.59
Conflict with personal schedule	1.50	373	.62
course not offered on campus	1.74	122	.69
family responsibilities	1.38	185	.62
interest in technology/internet	1.78	40	.95
Other	1.71	87	.71
Total	1.53	935	.66

Table 4 ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Satisfaction with SLN by Reason	Between Groups	(Combined)	15.572	5	3.114	7.360	.000
	Within Groups		393.117	929	.423		
	Total		408.689	934			

This data suggest that students do report higher satisfaction due to increased access. Students who are least able to access the courses due either to distance or to other responsibilities report significantly higher levels of satisfaction with the program.

High Quality Online Teaching and Learning

To discuss the other strategic goal for SLN - to provide a mechanism for maintaining consistently, high quality online teaching and learning across the SUNY system, requires that we define what we mean by "quality". Again we used socio-cognitive learning theory and principles of good practice in higher education to define and assure quality in the development, implementation and evolution of course design and faculty development in SLN. In brief, for our purposes, socio-cognitive learning theory suggests the importance of interaction, scaffolding, and active learning and underlies the best practices identified by authors such as Chickering and Gamson (1987) . These principles of good practice, based on decades of research on the undergraduate experience, are presented below, followed by survey results related to each principle.

A) Good Practice Encourages Contacts Between Students and Faculty

"*Being a shy person I am able to think questions and answers through before I respond. In a regular classroom setting I often don't get my question out before we are on to*

another topic. I really like the online classes. I wish I could complete my degree online…" (survey comment)

It has been suggested that information technologies, "…can increase opportunities for students and faculty to converse" (Chickering & Ehrmann, 1995) and that such conversation is critical to learning and satisfaction. So, we asked students whether they had high levels of interaction with their instructors and other students and about the quality of the interaction. Overall more that 75% of students reported high levels of interaction with their instructors and approximately 73% felt they had high levels of interaction with their online classmates. Additionally, approximately 78% of respondents felt that the quality of the interaction with their instructors was very high and approximately 70% felt the quality of interaction with fellow students was very high. When asked to compare the level of interaction to similar classroom based courses a majority felt there was as much or more interaction with their instructor and fellow students as in similar classroom based courses.

Socio-cognitive principles would predict that the amount and quality of interaction will relate to satisfaction and learning, and our results demonstrate that they do. The tables below show the correlations between students reports of the quantity and quality of interaction with faculty and with other students and their reports of satisfaction and learning in SLN courses.

Table 5 - Correlations between Interaction, Satisfaction, and Learning

		Interaction with Instructor	Quality of Instructor Interaction	Interaction with Fellow Students	Quality of Interaction with Fellow Students
Satisfaction	Pearson Correlation	.631**	.672**	.367**	.401**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	935	935	935	935
Reported Learning	Pearson Correlation	.619**	.631**	.376**	.394**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	935	935	935	935

** Correlation is significant at the 0.01 level (2-tailed).

If interaction is crucial to student reports of satisfaction and learning, then reported isolation, or lack of interaction is just as important. We asked students about feelings of isolation due to the format of the course. We found that approximately 30% of students did report some feelings of increased isolation, while about 70% did not. We also found that students who had more experience in online learning (those who had taken three or more online courses) were significantly less likely to report feelings of isolation than those were taking their first online course. This result would seem to indicate that

feelings of isolation may diminish with greater experience in negotiating the new learning environment. Clearly this is a finding that warrants further study.

B) Good Practice Uses Active Learning Techniques

"This was a good experience for me. This course made me do a lot of deep thinking and allowed me to further my education. I cherish the fact that I can learn at this stage of my life. Thanks very much for offering this course." (survey comment)

"I have to tell you that I read the chapters more carefully as it was my responsibility to learn the subject matter. This course has helped me with my concentration skills. I was surprised how much I enjoyed the course. It was a real challenge to me and I love a challenge." (survey comment)

Meaningful learning requires active student engagement. How well do traditional classroom practices do at actively engaging students? Frequently, not very well. Barnes (1980) found that, even among faculty who actively solicited student participation, students only responded 50% of the time when called upon. Karp and Yoels (1988) reported that in classes of less than 40, four to five students accounted for 75% of all interactions and that in classes of more than 40, 2-3 students accounted for more than half of all interactions. Stones (1970) in a survey of over 1000 students found that 60% stated that a large number of classmates listening would deter them from asking questions, even when encouraged to do so by the instructor.

In contrast, in the most recent SLN survey, 93.4% of students reported active participation in their online class. To get a sense of how active and in what sense the students engaged in active learning we asked them to compare their levels of participation in online discussions about course material with comparable classroom discussions. We found that students were about *twice* as likely to report active participation in online discussion than in classroom based discussions. Students also reported that they were about *twice* as likely to ask for clarification when they did not understand something online than in the classroom. One side benefit, due to the fact that all of this communication occurred through written means - about 83% felt that the online format helped them improve their ability to communicate effectively in writing.

It has been suggested that information technologies allow student and faculty to converse, "…more thoughtfully and safely than when confronting each other in a classroom or faculty office (Chickering & Ehrmann, 1995)" and that this increased comfort and level of thought contributes to learning and satisfaction. We asked students to compare the amount of thought they put into their online discussion comments with those they made in the classroom. We found that about 86% of respondents reported that they put *more* thought into online discussion comments than into comparable classroom discussion, providing support for this hypothesis. As would be predicted, a significant correlation exists between amount of thought invested in discussion responses, and learning and satisfaction.

Table 6 Correlation Between Thought in Discussion Comments, Satisfaction and Learning

		Satisfaction	Reported Learning
Discussion Thought	Pearson Correlation	.262**	.272**
	Sig. (2-tailed)	.000	.000
	N	935	935

** Correlation is significant at the 0.01 level (2-tailed).

To confirm whether online conversations did occur "more safely" i.e. with more opportunity to explore topics that might be difficult to explore face-to-face, we asked students how likely they were to ask an awkward question online as compared to the classroom and whether they were more likely to ask for clarification online than in the classroom. Approximately 69% reported they were more likely to feel comfortable asking an awkward questions online. Approximately 40% reported that were more likely to ask for clarification online, which was about twice the rate of those reporting that they were more likely to ask for clarification in the classroom (18%).

Authentic interaction implies that student-participants feel empowered to disagree, not only with each other, but also with the instructor. When asked whether they felt more comfortable disagreeing with the instructor in the online classroom, a large number of students (42%) reported that they did feel more comfortable dissenting in this environment.

C) Good Practice Gives Prompt Feedback and Communicates High Expectations

" *I absolutely love this class. (The Professor) expects a lot but it's all so clear and interesting that it actually is fun. I've learned so much! I wish more classes were on-line*." (Survey comment)

"I enjoyed this class because the teacher was helpful; she was prompt with answering questions and grading assignments. The teacher was very clear with what she wanted the class to do." (Survey comment)

"What I've appreciated most about this course has been the instant feedback and evaluations; critiques etc. from my professor. It's helped to keep me motivated and striving for better each week of the class. This has been a fantastic experience!" (Survey comment)

"There was very prompt response to discussion threads and test and assignment evaluations. Responses to comments were made within a day in most cases. This encouraged students to discuss with the instructor and other students on a regular basis. It felt like the course was alive; and help was there when you needed it." (Survey comment)

We asked students about the speed and quality of the feedback they received in their online courses. Approximately 85% reported that they received very prompt feedback and about 87% felt that they had received high quality, constructive feedback. Additionally more than 90% reported that the instructor provided clear expectations of how students could succeed in the course. As demonstrated in the table below each of these variables correlates significantly with reports of satisfaction and learning.

Table 6 - Correlations Between Satisfaction, Learning, Expectations and Feedback

		Prompt Feedback	Quality Feedback	Clear Expectations
Satisfaction	Pearson Correlation	.592**	.620**	.609**
	Sig. (2-tailed)	.000	.000	.000
	N	935	935	935
Learning	Pearson Correlation	.520**	.569**	.563**
	Sig. (2-tailed)	.000	.000	.000
	N	935	935	935

** Correlation is significant at the 0.01 level (2-tailed).

D) Good Practice Emphasizes Time on Task

"*I have learned more from this course than any other graduate course I have taken. There was a lot of work involved; but it only enhanced my understanding of lessons taught and has improved my teaching abilities in the classroom. I have; and will continue to recommend this system to fellow teachers who are trying to obtain a graduate degree. Thank You!!!* " (Survey comment)

"I love the learning experiences gained from the online courses. I find that I actually work harder because generally it does take more time and effort to complete the online courses. With this in mind; the time used is very valuable and adds more meaning and depth to the overall learning experience." (Survey comment)

We asked students to think about the format of their courses and the fact that there was "anytime-anywhere" access. Did they feel that this increased level of access resulted in more time studying? Approximately 71% of students reported that they did spend more time studying as a result of the increased access afforded by the online format.

Table 7 - Correlation Between Amount of Time Spent Studying, Learning, and Satisfaction

		Satisfaction	Learning
Time	Pearson Correlation	.265**	.294**
	Sig. (2-tailed)	.000	.000
	N	935	935

** Correlation is significant at the 0.01 level (2-tailed).

However, the possibility for wasting time in online courses, due to the distractions of the Internet is also possible. Approximately 13% of students did report that the online format resulted in more wasted time browsing and about 87% did not.

Wasting time can take other forms. For example, technical difficulties can consume time that would otherwise be devoted to more productive purposes. So we asked students about technical difficulties and their effect on the students learning and satisfaction. Approximately 88% of students felt that taking a course through SLN was no more technically difficult than taking a classroom based course. We also found that students who were less likely to report technical difficulties were more likely to report higher levels of satisfaction and learning.

E) General Results

Overall approximately 87% of SLN students reported being satisfied or very satisfied with their courses; about 90% report learning a great deal; about 94% reported being satisfied or very satisfied with SLN services; and 97% reported satisfaction with the SLN Helpdesk. When asked whether they would take another SLN course, only 1.7% responded that they would definitely not want to do this. Finally, overall, these 935 students were 1.7 times as likely to report learning more in their online courses (36%) than in comparable classroom-based courses (20.8%), though the majority felt they were equivalent (43.2%).

Faculty Survey Results

In addition to collecting data on student satisfaction and learning, we also collect data on faculty attitudes about teaching in this online environment. For the most recent semester we heard back from 255 faculty from more than two dozen institutions ranging from community college through four year and university centers. To understand student responses to online learning it is useful to explore the faculty experience as well. The following section provides information on faculty reactions and work that provides insight into student reported satisfaction and learning. Three instructional variables that seem most relevant are interaction, alternative means of assessment, and instructional design.

Interaction

We feel that importance of interaction in teaching and learning cannot be understated. Through interaction with the instructor, peers, and course content students have the opportunity to negotiate meaning and connect new concepts to previous knowledge. One measure of this important variable is faculty perceptions of interaction. To the item "Compared to classroom based teaching, rate your level of interaction with your online students" online faculty were, again, more than twice as likely to rate their interaction with online students as higher than their classroom students. Approximately 61% felt that their level of interaction with students was higher online than in the classroom, approximately 28% saw no difference, and about 26% thought the level of interaction was lower online than in the classroom. The remainder did not teach the course in the classroom.

We asked a similar question regarding interaction *between* students and found the following results - online faculty were more than twice as likely to rate interaction *between* their online students as higher than their classroom students. About 60% rated interaction between online students higher than their classroom students, about 28% saw no difference and 26% rated interaction between their classroom students as higher than their online students. The remainder did not teach the course in the classroom.

Alternative Means of Assessment

In order for instruction to become more learner centered, faculty must have an opportunity to consider alternatives to traditional methods and to be able to engage in more systematic design of instruction which incorporates those alternatives. Considering all the time and effort that faculty reported expending in the creation of courses (150+ hours), we wondered whether the experience of developing and teaching an online course afforded such opportunities. Apparently it does. Approximately 97% of survey respondents reported that developing and teaching their online course offered them a new opportunity to consider alternative means of instruction, and approximately 93% reported that the experience offered them a new opportunity to consider alternative means of assessment.

Systematic Design of Instruction

Regarding instructional design, we asked the following question - "Think about similar courses you have developed for the classroom - relative to those courses, how likely were you to systematically design instruction before teaching the course?" Respondents were more than nine times as likely to report more systematic design of instruction for their online courses than for their classroom courses. Approximately 58% of respondents reported higher levels of systematic instructional design online, about 37% reported no difference and about 6% reported less systematic design of instruction online.

Student Performance

We also wanted to understand how faculty perceived student performance in online courses as compared to similar classroom courses. To the question, "If you have ever taught this course in the classroom, how would you rate your online students' performance to your classroom students' performance?", respondents were twice as likely to report better performance from their online students then their classroom student. Approximately 33% reported better performance from online students, about 41% reported no difference in performance, and approximately 14% reported better performance from classroom students. The remainder did not teach the course in the classroom.

Inasmuch as faculty and student rated their online teaching and learning experiences superior to similar classroom experiences, does this mean that we are suggesting that online learning should replace the classroom? Absolutely not. Obviously there is a great deal more to residential higher education than this study reports on. But would the experience of designing and teaching an online course improve classroom teaching and learning. We asked faculty this question - and 85% agreed that it would.

Importance or Relevance to Other Institutions

Are these findings relevant to other institutions? We believe they are useful in a number of ways. Online learning environments are not easy to implement successfully. Effort, coordination, planning and expense is required. If an institution is considering systematic implementation of online education it is useful to know that success, as measured by traditional notions of best practice in higher education, is possible.

In general, although we acknowledge that these results may not be completely generalizable to other systems, to know that nearly 1000 students from dozens of institutions from associate level through graduate level programs reported high levels of learning and satisfaction in online courses, offered through a single, unified system, is potentially helpful. Positive student response to this learning environment demonstrates that it is possible to overcome the complexity and challenges involved in system-wide online learning initiatives, to provide increased flexible access, and to maintain high standards across courses.

For those who are concerned that the online learning is, by its very nature, cold, sterile, and isolating, knowing that the vast majority of these online students reported high levels and high quality interaction with their instructors and other students, and that the majority of students were unlikely to report feeling isolated, is potentially helpful. Knowing that the vast majority reported fast and high quality feedback as well as clear expectations for success is also encouraging. It is important to understand that such results are not likely without considerable planning. We believe a focus on developing systems (such as the student helpdesk and overall faculty development process) that emphasize the importance of student support and interaction is critical to success in this area.

Through co-relational research we have found that a number of variables correlate significantly with high levels of satisfaction and learning. Before embarking on the

implementation of new online learning environments it would be wise to consider the following: high levels of interaction with the instructor, and the quality of that interaction, interaction with fellow students and its quality, prompt and high quality feedback on assignments, clear expectations on how to succeed in the course and low levels of technical difficulties are all variables that correlate highly with both satisfaction and learning and, therefore need to be given a high priority in planning and developing an online environment. Perhaps not surprisingly, these are also variables that correlate highly with satisfaction and learning in the classroom.

Is online learning "as good as" the classroom?

This is a question that continues to appear in the popular media and is a cause for concern among online learning critics. From these results, the answer appears to be "No - it can be much better". We see reason for optimism in the knowledge that, in the most recent term for which data was collected, nearly 1000 online students from dozens of institutions not only reported high levels of satisfaction and learning, but, when asked to compare their online course to similar classroom courses, these students were: twice as likely to report active participation in such important activities as discussion of course materials; twice as likely to report asking instructors for clarification; twice as likely to report putting more thought into discussion; twice as likely to report spending more time studying. We also found that faculty were twice as likely to report higher levels of interaction with and between their online students; that they were able to explore and implement alternative means of assessment and instruction, and that they were nine times as likely to engage in more systematic design of instruction in their online class compared to similar classes they had developed and taught in the classroom.

It may be that the instructional improvements and more active student behaviors account for the fact that students were nearly twice as likely to report learning more online than in the classroom and that faculty were twice as likely to report better performance from their online students in the same course taught in the classroom. We also found that students who had taken four or more classes were no less likely to report high levels of satisfaction and learning in these courses than student who were taking their first course, i.e. this does not appear to be a novelty effect. Does this mean that online learning should replace the classroom? Of course not. Do faculty feel that the experience of developing and teaching an online course can improve what they do in the classroom. In our most recent survey the answer was yes.

These high levels of satisfaction and learning replicate findings from six previous surveys in the period 1998-2001.

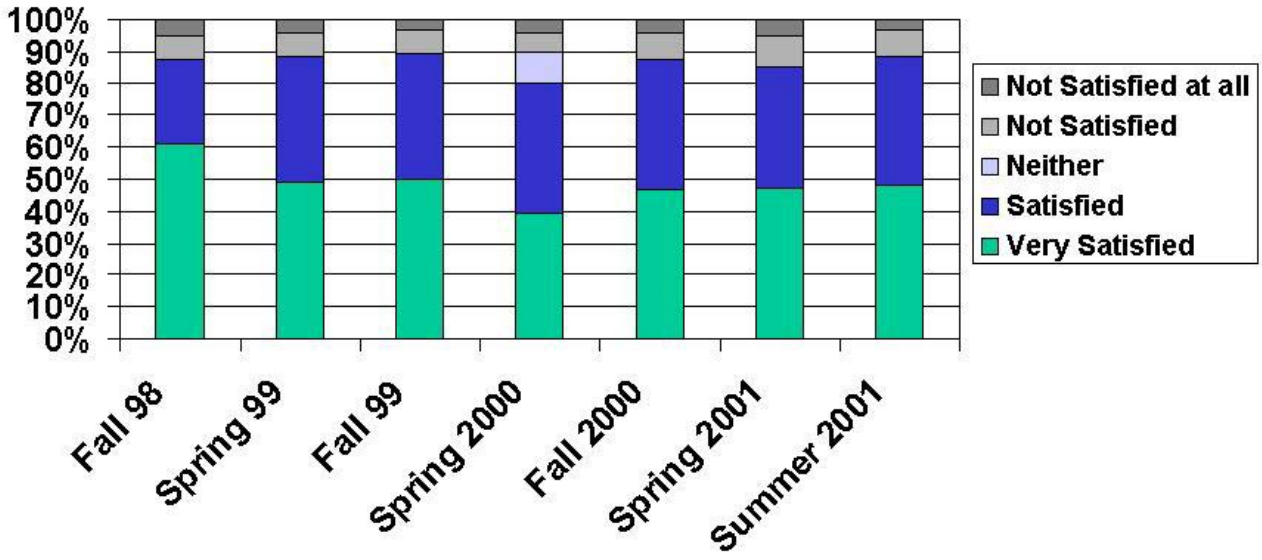


Table 8 - Student Satisfaction for the Past Six Terms in SLN
Responses to: "Overall I was very satisfied with this online course"

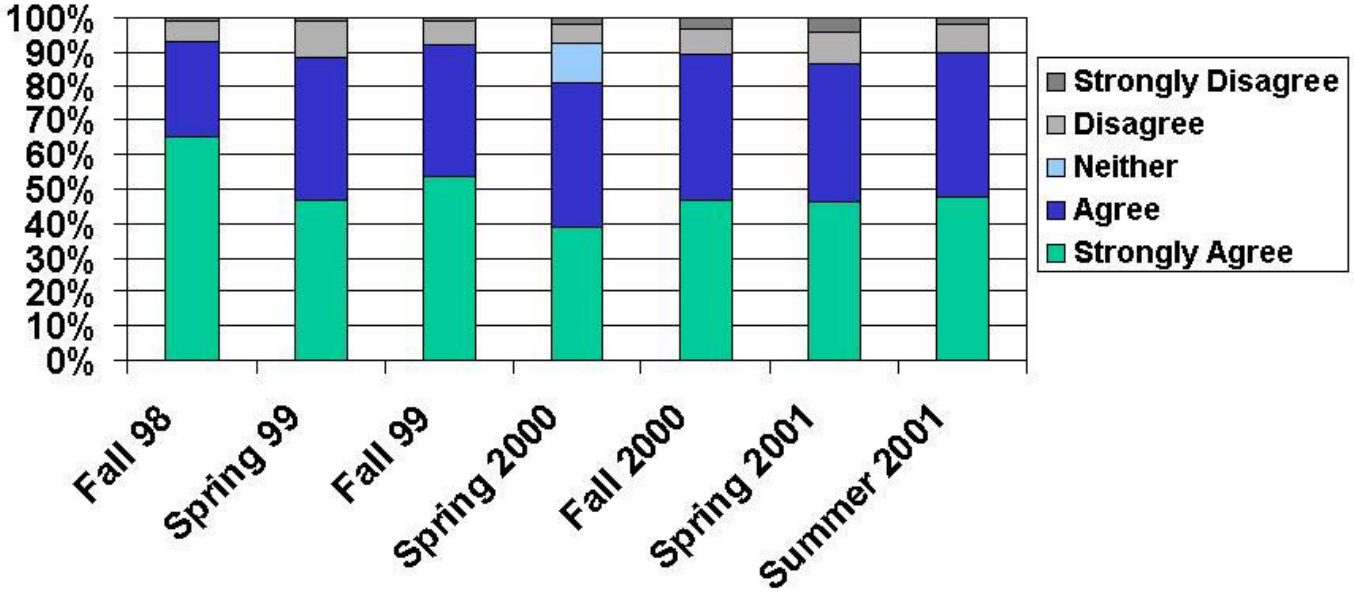


Table 9 - Reported Learning for the Past Six Terms in SLN
Responses to: "Overall, I learned a great deal in this online course."

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