Gender Similarity in the Use of and Attitudes About ALN in a University Setting

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ABSTRACT

This paper presents the results of an investigation of male and female student use of and attitudes about ALN after one year of implementation in a university setting. Results of the study revealed no significant gender differences.

KEY WORDS

Gender differences
ALN use
ALN Attitudes
Evaluation

I. THE PROBLEM

It is a widely expressed concern that females are more technophobic [1], have more negative attitudes toward computers [2], and are less confident in their use of computers [3] than males when they enter universities. The conclusions drawn by several researchers is that by the time students enter the university, the males are more familiar with computers than are the females [4,5]. Still other researchers speculate that females are also less comfortable with the way that computers are used at many universities [6].

Computers are now used in courses across curricula and disciplines on most college campuses; they are no longer confined to computer science classrooms. Professors are introducing computer conferencing into the classroom as a way for students to conduct teamwork and continue discussions outside of the classroom. As college students are required to communicate on-line more often, some researchers worry that women will be fundamentally disadvantaged not only by their lack of familiarity with computers but by the way in which males and females differ in their use of computers [7]. They worry that this will translate into females using the computer less, using computers less efficiently and in general, maintaining a more negative attitude toward the use of computers than their male counterparts.

Tannen [8] believes that males are more likely to consider computer conferencing as a place to get and give information while females see it more as a place to pose questions and come to a

consensus of understanding. If so, the two styles of computer use may come into conflict if the "fact-providers" make the "consensus-builders" feel inadequate and uncomfortable. The consensus-building females may become reluctant to share their "wrong" ideas and consequently stop participating. Hardy [9] believes the "consensus-builders" are more likely to flourish and more freely to exchange ideas in a nurturing, less judgmental environment. Some researchers [10] warn that computer conferencing can easily become a male dominated situation because women are often less confident about expressing their ideas in a public forum. Herring [11] found that among 1800 members of a linguistic list serv, both genders asked and provided answers to basic information questions, but the men responded more often to theoretical discussions.

A few researchers have a different take on the dynamics of computer conferencing. Selfe and Meyer [12] contend that computer based exchanges of written discourse may encourage women to express their ideas more and that computer conferencing is actually the perfect forum for young women to learn to more openly and freely exchange ideas. They believe that conferencing provides women more uninterrupted time to think about their response.

Given the above research literature and the fact that computers are now an integral part of most students' academic experience, universities need to determine whether males and females differ in their use of computers if they want to make the academic playing field the same for all students [13]. This paper begins to address this issue.

II. THE RESEARCH QUESTIONS

In March of 1995 the Sloan Center for Asynchronous Learning Environments (SCALE) was established at the University of Illinois at Urbana-Champaign (UIUC). SCALE is charged with organizing and directing a three-year Sloan Foundation-funded project to promote the use of asynchronous learning networks (ALN) at UIUC. Faculty involved in the Sloan Center are restructuring their undergraduate courses to incorporate various computer techniques associated with ALN. These ALN techniques include network-based access both to learning materials (e.g., multimedia tutorials and information on the World Wide Web) and to people (via conferencing software such as FirstClass or PacerForum). Computer conferencing was the primary ALN method used by faculty in the fall semester while a growing number of instructors started using the Web in the spring semester.

At the present time a comprehensive evaluation is being conducted of all SCALE activities. One component of the evaluation is examining how male and female students use ALN and their attitudes about ALN as an educational strategy.   Three of the research questions for this evaluation were used for this study. They are:
(1) Is the frequency of ALN use the same for male and female students?
(2) Are male and female students using ALN differently?
(3) Do male and female students differ in their attitudes about using ALN in courses?

III. THE METHODS

Three measures were used to study gender differences in student use of and attitudes toward asynchronous learning networks in both the fall and spring -- Student Surveys, Course Monitoring, and Group Interviews.

Student Surveys. Two end-of-course, in-class surveys were administered to students across 22 curricula in 6 different colleges throughout the UIUC at the end of the Fall 1995 and Spring 1996 semesters. One survey ("Conferencing") was administered to students in courses using computer conferencing and another survey ("Web") to students in courses primarily using the Web to access course materials, take on-line quizzes, or explore computer resources. The two surveys were administered to 1118 students in 17 courses in the Fall semester and to 1033 students enrolled in 23 courses in the Spring semester.

Course Monitoring. A total of four SCALE courses primarily using computer conferencing were monitored by the evaluators in the fall and spring semesters to observe how often students and faculty participated in the conferencing activities. Tallies of student, teaching assistant, and professor postings, which were made using the course conferencing system, were recorded weekly. Gender breakdowns were recorded for all student interactions.

Group Interviews: A total of twenty-eight end-of-course group interviews, involving seventeen courses, were held in connection with this study during the Fall 1995 and Spring 1996 semesters. Twenty-four of these interviews were with students taking the courses and four were with teaching assistants from four of the courses. External reviewers conducted all of the student interviews during regular class time; none of the professors were present during any of the interviews. These interviews are not discussed in detail in this paper but full results can be found at http://w3.scale.uiuc.edu/scale/f95eval/index.html and http://w3.scale.uiuc.edu/scale/s96eval/index.html.

IV. THE SURVEY RESPONDENTS

The gender, grade level, and ethnic background of the students responding to the surveys are presented in Tables 1 and 2. For both semesters the student respondents were approximately split between males and females, primarily freshmen and sophomores and predominantly Caucasian.

	Fall Conf. Use		Fall Web Use		Spring Conf. Use		Spring Web Use	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Freshman	47	48	43	25	38	30	63	60
Sophomore	10	16	35	39	22	29	24	25
Junior	20	18	12	21	14	17	8	11
Senior	19	18	9	12	26	24	4	3
Other	5	1	0	3	0	0	0	0
Total	50%	50%	71%	29%	53%	47%	56%	44%

Table 1: Gender and Grade Level of Students Responding to the Survey in Fall and Spring Semesters

	Fall Conf. Use		Fall Web Use		Spring Conf. Use		Spring Web Use	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
African-American	5	4	4	9	9	5	3	2
Asian-American	10	7	5	5	9	11	15	15
Caucasian	82	85	86	72	76	77	76	78
Latino/a	1	0	3	7	4	3	3	3
Native American	0	0	0	2	0	0	0	1
Other	2	3	2	5	4	4	3	2

Table 2: Gender and Ethnic Background of Students Responding to the Survey in Fall and Spring Semesters

V. THE RESULTS

Results of the surveys, group interviews, and course monitorings were analyzed to detect gender differences and/or similarities. Where appropriate, t-tests of the means were conducted to determine statistical significance. Factors were determined as significant at alpha = .05. Results will be presented under the following six questions:

- Does frequency of ALN use differ according to gender?
- Does manner of computer conferencing differ according to gender?
- Does ease of computer use differ according to gender?
- Does quality of overall experience differ according to gender? and, more generally,
- Where are students using computers?
- What, specifically, does ALN add to instruction?

A. Does frequency of ALN use differ according to gender?

Survey results presented in Table 3 indicate that while in both semesters female students reported using computers slightly more often for conferencing than did male students, only the Fall 1995 means were statistically different (t = 3.43, p = .006). Additionally, while male students accessed the Web slightly more often than did female students, again only the Fall 1995 means were statistically significant (t = -2.49, p = .01). Figure 1 shows the overall similarity in male and female use of ALN. Students report to be conferencing and accessing the Web, minimally, at least weekly.

FirstClass (FC) conferencing software was used in the four courses monitored during the fall and spring semesters. In general, students used FirstClass to communicate with the instructor/TA and/or with each other, to read the communications between student and student or between student and instructor, to answer assigned questions posted by the instructor, or to hand in assignments. While it was not possible to monitor how many times males and females read postings without making a response, the evaluators were able to take counts of FC postings throughout each semester. These counts are presented in Table 4. Results of the monitoring of computer conferencing in these four courses support the similarity of usage between males and females as reported on the surveys. Typically when there was an uneven proportion of males and females there

were more postings made by the majority gender. However, the average percentage of postings for males (48.8%) and females (51.2%) across all nine sections was approximately equal.

	Fall Conf. Use		Fall Web Use		Spring Conf. Use		Spring Web Use	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Not at all	7	18	23	11	3	5	3	5
A few times	22	19	51	58	24	30	25	19
Once a week	30	29	19	22	44	37	25	19
Few days a week	35	30	6	8	24	22	43	44
Everyday	7	4	1	2	5	6	4	13
Mean response	3.1*	2.8*	2.1*	2.3*	3.0	2.9	3.3	3.4

(Not at all = 1, Everyday = 5) - * *statistical significance (p<.05)*

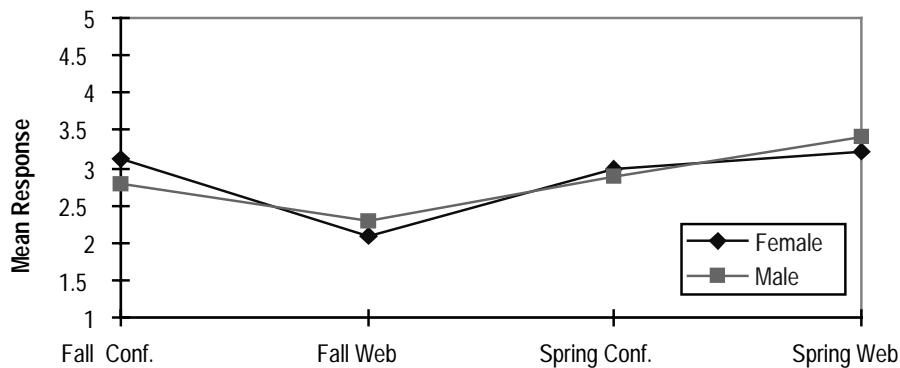Table 3: Frequency of Computer Conferencing and Web Use as Reported by Male and Female Students

Figure 1. Similarity between male and female frequency of computer use.

	Female % in class	Male % in class	Female % of postings	Male % of postings
Fall Semester				
Course A Section 1	63	37	67	33
Course A Section 2	55	45	62	38
Course A Section 3	50	50	60	40
Course B Section 1	52	48	48	52
Course B Section 2	39	61	49	51
Course B Section 3	39	61	34	66
Course B Section 4	48	52	48	52
Spring Semester				
Course C	60	40	53	47
Course D	32	68	40	60

Table 4: Percent of Course Conference Postings Made by Male and Female Students in Nine Course Sections

B. Does manner of computer conferencing differ according to gender?

Survey results presented in Table 5 indicate that slightly more female than male students used conferencing for social <u>and</u> instructional interaction with other students and the instructor. The differences were more noticeable in the fall than in the spring, especially for instructional interactions with students or instructors.

	Fall Conferencing		Spring Conferencing	
	Female %	Male %	Female %	Male %
Social with other students	26	25	25	20
Social with TA or professor	23	21	25	21
Instructional with students	49	38	41	38
Instructional with TA or professor	73	62	82	80

Table 5: Type of Conferencing Use Reported by Male and Female Students

C. Does ease of computer use differ according to gender?

Student responses to the survey question asking about their difficulty using computers in ALN courses are summarized in Table 6. In general, both male and female students found the use of computers to be "Somewhat easy" or "Easy," with males reporting slightly, yet significantly, less

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Difficult to use	4	4	8	2	1	2	3	7
Somewhat difficult	12	6	16	12	4	6	9	10
Somewhat easy	32	31	29	33	33	30	41	37
Easy to use	51	59	48	53	62	62	48	47
Mean response	3.3*	3.5*	3.2*	3.4*	3.5	3.5	3.3	3.2

(Difficult to use = 1, Easy to use = 4) - *** statistical significance ($p < .05$)*
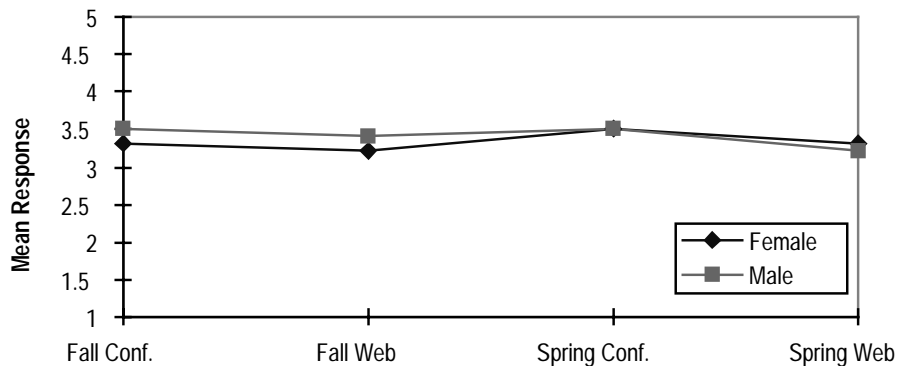Table 6: Ease/Difficulty in Using Computers as Reported by Male and Female Students

Figure 2. Similarity between male and female ease in using computers.

difficulty than females in the fall semester on both the Conference Survey (t = 2.20, p = .03) and the Web Survey (t = 2.17, p = .03). The similarity of male and female responses is also shown in Figure 2.

D. Does quality of overall ALN experience differ according to gender?

Student ratings of their overall experience using computers in ALN courses are summarized in Table 7 and displayed in Figure 3. There was no significant difference between male and female responses with both genders reporting positive experiences. Students in courses using computer conferencing were asked whether they would like to take another ALN course. Again, there was no statistically significant difference between male and female interest in taking another course using ALN. Student responses, presented in Table 8, reveal approximately 70% of both the males and females answered "Probably yes" or "Definitely yes."

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
A waste of time	9	14	8	5	5	9	-*	-
-	17	10	12	10	12	11	-	-
-	32	28	35	24	27	25	-	-
-	28	34	28	51	43	44	-	-
An excellent experience	15	14	17	10	13	11	-	-
Mean response	3.2	3.2	3.3	3.5	3.4	3.4	-	-

(Waste of time = 1, Excellent = 5) - * Item was mistakenly omitted from spring Web survey.

Table 7: Rating of Overall Experience Using Computers as Reported by Male and Female Students
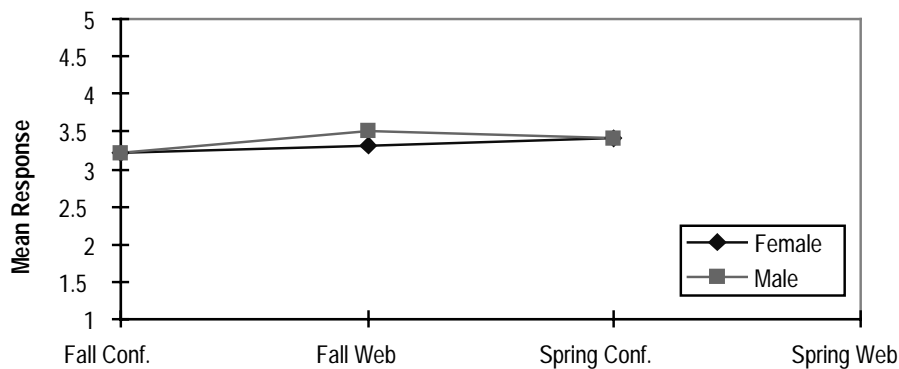

Figure 3. Similarity between male and female ratings of overall experience using computers.

	Fall Conf.		Spring Conf.	
	Female %	Male %	Female %	Male %
Definitely no	8	8	9	8
Probably no	26	23	21	16
Probably yes	46	49	54	57
Definitely yes	20	21	17	20
Mean response	3.8	3.8	3.8	3.9

(Definitely no = 1, Definitely yes = 4)

Table 8: Interest in Taking Another ALN Course as Reported
         By Male and Female Students

E. Where are students using computers?

In both semesters male students used computers in their residence hall room or apartment more often than did female students as indicated in Table 9. Female students were more likely to use computer lab sites on campus or in their residence hall than were male students.

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Room via modem	19	24	23	34	22	30	43	53
Res. Hall Lab Site	24	20	34	20	22	17	27	13
Campus Lab Site	51	48	42	42	52	48	27	27
Other	6	8	0	5	4	5	4	7

Table 9: Primary Location of Computer Use As Reported by Male and Female Students

F. What, specifically, does ALN add to instruction?

Students were asked what effect the use of computers had on the following seven aspects of their learning:

- amount of interaction with other students,
- quality of interaction with other students,
- amount of interaction with the instructor,
- quality of interaction with the instructor,
- amount of learning,
- amount of motivation to learn, and
- familiarity with computers.

Student responses are summarized in Tables 10a,…,10g. Male and female respondents showed little difference in their ratings of ALN impact when results are considered across both semesters. The only consistently significant difference between genders was reported for increases in computer familiarity as demonstrated in Figure 4. Females reported that the use of ALN had made a positive impact on their computer familiarity on both the Fall 1995 ($t = -3.65$, $p = .003$) and the Spring 1996 ($t = -3.915$, $p = .0001$) conference surveys. Additionally, females also reported an

increase in their computer familiarity on both the Fall 1996 (t = -6.40, p = .001) and Spring 1996 (t = -2.0, p = .046) web surveys.

Effects of Conferencing and/or Web Usage as Reported by Male and Female Students

	Fall Conf.		Spring Conf.	
	Female	Male	Female	Male
	%	%	%	%
Decreased	0	1	3	4
Somewhat decreased	1	1	5	4
No effect	47	54	48	53
Somewhat increased	34	29	33	26
Increased	18	16	11	13
Mean response	3.7	3.6	3.4	3.4

(Decreased = 1, Increased = 5)
Table 10a: The Amount of Your Interaction with Other Students

	Fall Conf.		Spring Conf.	
	Female	Male	Female	Male
	%	%	%	%
Decreased	1	1	3	4
Somewhat decreased	1	1	4	4
No effect	61	62	62	60
Somewhat increased	27	26	24	22
Increased	11	10	7	10
Mean response	3.4	3.4	3.3	3.3

(Decreased = 1, Increased = 5)
Table 10b: The Quality of Your Interactions with Other Students

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female	Male	Female	Male	Female	Male	Female	Male
	%	%	%	%	%	%	%	%
Decreased	1	1	1	4	4	4	5	8
Somewhat decreased	2	1	1	31	5	4	14	14
No effect	41	43	48	64	24	33	54	43
Somewhat increased	34	39	31	2	49	41	20	28
Increased	22	17	19	0	19	18	8	6
Mean response	3.7	3.7	3.7*	3.4*	3.7	3.6	3.1	3.0

(Decreased = 1, Increased = 5) - *statistical significance (t = -3.78, p = .002)*
Table 10c: The Amount of Your Interaction with the Instructor

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Decreased	1	1	0	0	3	4	5	7
Somewhat decreased	4	1	5	0	5	5	9	10
No effect	48	52	69	84	41	43	62	52
Somewhat increased	28	32	18	10	35	32	17	20
Increased	19	14	9	6	16	17	7	11
Mean response	3.6	3.6	3.3	3.2	3.6	3.5	3.1	3.2

(Decreased = 1, Increased = 5)
Table 10d: The Quality of Your Interaction with the Instructor

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Decreased	1	1	0	0	2	1	3	5
Somewhat decreased	2	1	1	3	2	1	3	5
No effect	43	44	27	48	36	39	10	20
Somewhat increased	38	43	46	40	43	39	51	49
Increased	17	11	26	9	15	17	27	23
Mean response	3.7	3.6	4.0*	3.6*	3.6	3.7	3.9	3.8

(Decreased = 1, Increased = 5) - *statistical significance (t= -4.629, p =.001)*
Table 10e: The Amount of Your Learning

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Decreased	2	1	1	0	2	3	4	6
Somewhat decreased	4	3	2	2	8	5	14	10
No effect	51	63	48	66	53	58	35	32
Somewhat increased	32	24	32	29	29	21	28	42
Increased	12	9	18	4	8	13	19	10
Mean response	3.5	3.4	3.6*	3.3*	3.3	3.4	3.4	3.4

(Decreased = 1, Increased = 5) - *statistical significance (t = -3.21, p = .001)*
Table 10f: The Amount of Your Motivation to Learn

	Fall Conf.		Fall Web		Spring Conf.		Spring Web	
	Female %	Male %	Female %	Male %	Female %	Male %	Female %	Male %
Decreased	-	-	-	-	-	-	-	-
Somewhat decreased	-	-	-	-	-	-	-	-
No effect	24	38	37	20	209	43	18	33
Somewhat increased	39	36	39	40	47	38	47	34
Increased	37	26	24	41	33	19	36	33
Mean response	3.9	4.1	3.9	4.2	3.8	4.1	4.0	4.2

(Decreased = 1, Increased = 5)

Table 10g: Your Familiarity with Computers
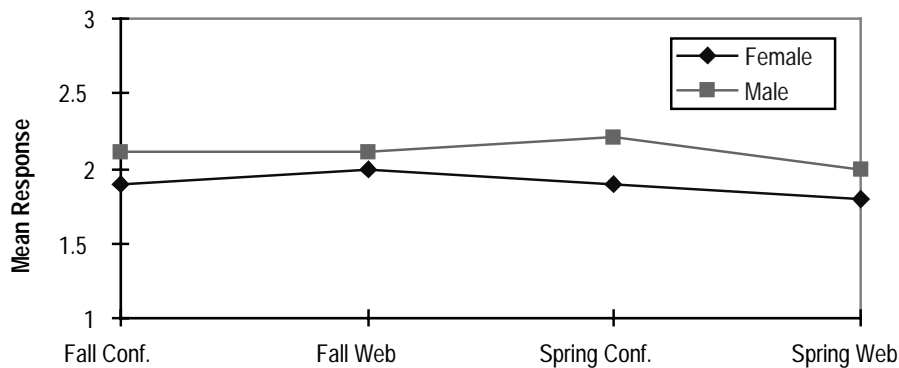
Figure 4. Difference between male and female increases in computer familiarity.

VI. DISCUSSION

Probably for the first time in years of doing educational research the authors were delighted to complete a study that yielded few significant differences! We found that, for the most part, both males and females made similar use of ALN, had similar (positive) attitudes about their "computer experience," and shared a common desire to take more courses using computers. Few significant differences between genders is encouraging to all who see the potential value of using computers in the classroom but who are also concerned about placing anyone, or any group of individuals, at a disadvantage. Further, the one consistently significant difference, familiarity with computers, suggests that ALN even helps correct previous inequalities. These preliminary, and certainly not conclusive, results do not support the notion that one gender profited more or less by the integration of computers in college instruction.

The few significant, yet small-in-magnitude, gender differences revealed that female students:
- used computers more often for conferencing with the instructor and other students but less often for exploring resources on the Web,
- found using computers to be slightly more difficult,
- were less likely to use personal computers in their apartment or residence hall room, and

- reported greater gains in their familiarity with computers after taking an ALN course.

By attempting to explain or understand these differences we may be able to provide some direction to future ALN efforts on college campuses. The first difference listed is a finding which is consistent with the research literature and one that addresses the social, communicative nature of ALN conferencing and the fact finding, source seeking activity of using the Web. Females did more conferencing and less Web work, or stated differently, females used computers more to communicate than to explore.

The other three differences listed may all be attributed to females having less computer experience prior to entering college than males. Females reported greater gain in computer familiarity or reported to get more out of their first college experience than did males. The females also reported more difficulty using computers throughout the semester. Furthermore, focus groups with many of the students revealed that often females did not use their personal computers for course conferencing simply because they did not know how to make the connection. Said one female student, "I think I need some kind of card to access the Web. I just don't know how." Another female using her personal computer explained how happy she was that her "brother came by and installed the necessary software."

Acknowledging these four gender differences, while small in nature, can help us plan for future integration of ALN into campus classrooms. More computer training of students, especially females, needs to be done to bring all students to a satisfactory level of familiarity. Female students in particular may need to be shown how to connect personal computers to the campus network and/or install software so that both genders can benefit from the convenience and added safety of computing from home or apartment. Gender differences in Conferencing and Web search behavior may diminish with campus introduction of new generations of Web search engines that incorporate both conferencing and search applications. Instead of having to launch different applications to participate in conferencing and Web exploration, students may have to launch only one application in the future. Thus, females who are already conferencing may find it easier and more convenient to explore the Web while they have the application open, and vice versa for male students.

Obviously more work is needed to determine how all students are using and benefiting from the use of computers in and out of the classroom. The numbers were too small in this study to determine if students of different ethnicity profited equally by the introduction of computers. This study was also unable to track the extent to which students participated by reading messages only and not posting, or used e-mail instead of the recommended conferencing software, or participated in private chats that could not be monitored by an external evaluator. However, the results of this preliminary investigation of student use of computers encourages us to expand campus use of ALN computing and to continue our examination of student behavior and attitudes.

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