
Development, Delivery, and Outcomes of a Distance Course for New College Students

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ABSTRACT

A FOUR-WEEK ONLINE INFORMATION LITERACY COURSE for new college students at Ohio State University enrolled almost 500 students during the 1999-2000 academic year. The course, Internet Tools and Research Techniques, utilizes net.TUTOR interactive tutorials as an electronic text, along with Web-based tests and practice-oriented worksheets that are graded automatically by the course management software. This article presents an overview of the course, provides data about the student population, and examines various measures of success, including performance on assignments, final grades, and student attitudes toward the course. Communication challenges, student self-regulation, and the value of flexible assignment schedules are also considered.

INTRODUCTION

Distance education, defined by Boettcher (2000) as a process "characterized by the separation, in time or place, between instructor and student" (p. 37) is increasingly popular on college campuses across the United States. This trend is documented in a study of 1,600 post-secondary institutions released by the U.S. Department of Education's National Center for Education Statistics (1999). According to this report, 34 percent of the institutions surveyed offered distance courses in 1997-98. The study estimates that there were 1,661,100 enrollments in all distance courses offered by two- and four-year institutions, with most of these at the undergraduate level. Another 20 percent of institutions reported that they

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planned to offer distance courses within three years (p. 15). The Internet is the engine of this growth. Of the schools that offer, or are planning, courses, 82 percent intend to provide these primarily through "asynchronous" Internet instruction using e-mail and the Web (p. 39).

A parallel trend in higher education is the movement to define student computing and information literacy requirements for undergraduates in order to prepare students for the workplace. For example, Mendels (1999) notes that students at the University of Texas at Arlington must master five computer-related skills: use of spreadsheet and word processing programs; ability to use the school's online library research services; ability to use e-mail; and ability to conduct Internet-based research. At Ohio State University (OSU), the vice-provost for Undergraduate Studies convened a faculty Committee on Student Computing Competencies in 1999. This group created a list of recommended competencies (<http://gateway.lib.ohio-state.edu/csc/>) that extends beyond computing skills to encompass the following research skills:

- use a Web browser to search for information efficiently,
- learn to use the libraries' print and online information sources,
- choose appropriate research tools,
- evaluate and choose the best information sources, and
- use key information sources for your major field.

The OSU Committee also recommended that students have access to different methods for acquiring these skills, from self-paced learning resources to credit courses. In response to that need, University Libraries, in partnership with University College (the unit that enrolls most freshmen at Ohio State) developed a one-credit distance course, Internet Tools and Research Techniques. This course serves a dual purpose related to both of the trends discussed here. It helps students to develop the recommended research competencies and also prepares them to participate in other distance courses or courses with online segments offered by the university. Development, delivery, and outcomes of that course are the focus of this article.

EVOLUTION OF THE DISTANCE COURSE

Although the Libraries' Office of User Education has worked with new students enrolled in University College at Ohio State for the past twenty years, the distance course Internet Tools and Research Techniques (offered as UVC 120) is a new type of partnership for both units. It is the first credit course in research skills offered by the libraries as well as the first distance offering for University College. Additionally, this new course appears to fill a perceived need by students for instruction in this area.

Most new students have had some contact with the Internet before coming to Ohio State, but their experiences are not uniform. Those who

are familiar with Web browsing are not usually proficient at searching adeptly in this new medium or evaluating the information they find. Few high schools provide significant instruction in these techniques, so students typically learn what they can on their own or from peers. In a recent study of middle and high school students' Internet use, Ebersole (1999) asked media specialists to review Web sites that students used for their research. The reviewers found only 27 percent of the sites to be suitable for that purpose (see abstract). He suggests that these students are ignorant about how to conduct an effective search online and how to distinguish between reputable and questionable information (see chapter five).

Many students admit that they frequently fail to find what they are looking for when searching the Web. A recent e-mail message from a student enrolled in UVC 120 confirms this assertion:

What I hope to get out of this course is a better understanding of what I spend many hours a week playing on. I have been "online" since 1996 and have spent many hours cruising down the "information superhighway." However, I don't know how to do effective research, so that is mainly what I want to learn about. (S. Irwin, personal communication, April 18, 2000)

Thus student interest in improving their searching skills provides the libraries with an opportunity to offer instruction to a willing audience on a whole range of research competencies.

During Winter quarter 1999, the author developed the syllabus and initial assignments for the course, which was offered for the first time to a small group during the Spring quarter 1999. After revisions based on student comments, the course was offered to larger groups of students in academic year 1999-2000. In Fall 1999 and Winter 2000, 407 Ohio State students took this distance course for one credit. Eighty-seven students completed the course in Spring 2000.

COURSE PROFILE

The course begins during the fourth week of the ten week academic quarter. This allows students who are new to the university several weeks prior to the beginning of the course to establish their computing accounts and become familiar with the campus e-mail system. The course consists of eighteen required assignments that are completed over a period of four weeks. Each week that the course is in session, new assignments are made available to students. All must be completed by the end of the course, when Course Sorcerer, the OSU-developed software used to manage the online assignments, closes access to them.

A course Web site (<http://gateway.lib.ohio-state.edu/tutor/120/>) is the jumping off point for students to learn more about how the course works, read answers to frequently asked questions, find instructor contact

information, and connect to the course assignments. Students are added to a course mailing list that enables the instructor to communicate easily with them by e-mail several times each week while the course is in session. This course mailing list is used primarily to distribute announcements and reminders about assignments. It is also used to disseminate additional information that will help students as they complete assignments, such as details about how to connect to library databases from off campus using the university's proxy server.

Registered students are also added automatically to a roster that resides within the course management software and controls access to the online assignments. Students must have a university computing account (used for authorization) and must also be listed on the official roster for the course before being permitted to view or complete any assignments.

Each of the four weeks is devoted to a different topic. The focus of the first week is becoming competent with Internet tools such as the Web browser, e-mail and online discussion groups, with the campus Web environment, and with course requirements. During the second week, students learn searching techniques that are effective in various types of online sources and become more familiar with different types of Web search tools and with specialized databases. The third week focuses on research skills, including research strategy, evaluation of sources, intellectual property issues, and citation of online sources. Finally, during the last week of the course, students complete a Capstone Exercise that allows them to demonstrate their searching and evaluation skills.

net.TUTOR (<http://gateway.lib.ohio-state.edu/tutor/>), a program of interactive Web-based tutorials developed by the author, forms the content core of this course. Ten of the net.TUTOR tutorials are assigned as required reading during weeks one through three. Students must also complete the online tests that are associated with each tutorial. Online worksheets, which provide additional practice using the skills and concepts taught by the tutorials, are also required. The tests and worksheets use multiple-choice questions so that they may be automatically graded by the course software. Results and feedback are thus immediately available to students. The Capstone Exercise utilizes short answer and essay questions but is structured so that it can be easily graded by the instructor and teaching assistant.

ACTIVE LEARNING

Carlson and Repman (2000) note that effectiveness of Web-based instruction (WBI) is contingent on the ability to establish an active learning process. They state that "WBI alters not only the method in which information is presented to the learner but also changes the way in which the learner interacts with information It is necessary to design instruction which engages the learner in interactive activities" (p. 13).

UVC 120 uses several methodologies for providing a range of interactive assignments. First, each net.TUTOR tutorial that is assigned as required reading is laced with practice activities which have proven quite popular. A clear majority of users who submit tutorial evaluations indicate that they complete all or some of the suggested activities (see net.TUTOR evaluation data at <http://gateway.lib.ohio-state.edu/tutor/about.html>). Ehrmann (1997), director of the American Association of Higher Education's Flashlight Project, reports that use of computer-based tutorials "results in a substantial improvement in learning outcomes and speed, perhaps around 20% or more on average Few other teaching methods have demonstrated such consistently strong results as this type of self-paced instruction."

Six online worksheets assigned during the course are also practice-oriented, as the following sample task from the Web Search Worksheet indicates:

Most Web indexes allow limiting of searches by different variables. Use *HotBot* to find an audio recording (MP3 format) of the Beatles' song "Yesterday."

- Check the box next to **MP3** (on the left side of the page)
- Type these words in the search box: **Beatles yesterday**

How many matches does *HotBot* return for this search?

LEARNER PROFILE

Thus far, most students have been solicited primarily from the ranks of those freshmen and transfer students already enrolled in University College's UVC 100 course. UVC 100 provides an orientation to the campus and academic life, including research. The OSU Libraries' long-standing Library Instruction Program (LIP) is integrated with UVC 100. As an added incentive for these students to consider taking the new one-credit distance course (UVC 120), they have been excused from the requirement to complete the two library assignments associated with the UVC 100 course.

In course evaluations, students expressed a variety of reasons for taking the course, as shown in Table 1. Approximately half of the respondents (who comprised about one-third of the total registered for the course) indicated that their primary reason for taking the course was the need for an additional one hour course in order to remain a full-time student. The ability to enter a new course that is just beginning during the fourth week of the quarter is attractive to students who have dropped a course.

A study by the Institute for Higher Education Policy (1999) that examined effectiveness of distance learning notes that: "Learner characteristics are a major factor in the achievement and satisfaction levels of the distance learner" (p. 6). Some data regarding learner characteristics for

UVC 120 gathered from online student surveys and course evaluations are presented in Table 2.

Table1. Student Reasons for Enrolling in Course.

	Fall 1999	Wtr 2000	Spr 2000
Needed 1 hour course	46%	56%	45%
Interested in course topic	19%	19%	25%
Will help with major field	0%	4%	11%
Recommended by advisor	22%	14%	17%
Other	13%	7%	2%

Table 2. Learner Characteristics—Prior Computing Experience.

Total Years of Experience:	Fall 1999	Wtr 2000	Spr 2000
10+	37.6%	31.7%	37.5%
6-9	26.6%	26.0%	28.8%
3-5	27.5%	32.5%	23.8%
1-2	8.3%	9.8%	10.0%
TOTALS	100.0%	100.0%	100.0%
Level When Introduced:	Fall 1999	Wtr 2000	Spr 2000
Before grade 1	8.8%	4.1%	3.8%
Elementary school (1-8)	70.8%	68.3%	70.0%
High school (9-12)	12.4%	17.1%	16.3%
College	6.2%	8.1%	6.3%
No introduction	1.8%	2.4%	3.8%
TOTALS	100.0%	100.0%	100.0%

One characteristic likely to have an impact on student success in a distance course is prior computing experience. In brief student surveys, data on total years of computing experience and grade level when students were introduced to computers were gathered. Less than 10 percent of respondents indicated that they had two or fewer years of computing experience or had been introduced to computers in college. More than 30 percent indicated ten or more years of prior computing experience and approximately 70 percent reported that they had been introduced to computers in elementary school.

Another survey question asked respondents how many hours per day they used computers. As Table 3 indicates, almost half of the respondents answered that they spend between one and two hours each day using computers for various tasks (the question did not specify Internet use alone). Another 25 percent indicate that they spend three to four hours per day at the computer.

Table 3. Learner Characteristics—Daily Computer Use.

Hours	Fall 1999	Wtr 2000	Spr 2000
8+	5.3%	3.3%	7.5%
5-7	14.0%	9.8%	10.0%
3-4	26.3%	26.0%	25.0%
1-2	47.4%	47.2%	53.8%
<1	7.0%	13.8%	3.8%
TOTAL	100.0%	100.0%	100.0%

In Spring 2000, an additional source of data on students was incorporated into the course registration process. This new registration survey form asked students where they expected to complete assignments for the course. Of those responding, 75 percent indicated that they planned to use their own computers, 15 percent intended to use a roommate's computer, while only 7 percent expected to use those in campus computer labs or libraries. Students were also asked to characterize their prior experience using Internet tools. Only 7 percent indicated that they had little or no prior experience, 67 percent said that they had moderate experience, and 24 percent noted that their prior experience was extensive (the remainder did not respond to these questions).

MEASURES OF SUCCESS

A growing body of educational literature attempts to compare student learning in "traditional" and distance courses. In a recent book, Russell (1999) compiled 355 research studies related to the "no significant difference phenomenon." The Institute for Higher Education Policy (1999) report entitled *What's the Difference?* criticized the quality of much of this research on the effectiveness of distance learning. In the realm of library instruction, Germain, Jacobson, and Kaczor (2000) studied effectiveness of presentation formats for teaching first year students in a comparative fashion and found "no difference in the effectiveness of the two types of instruction, Web and live, based on number of correct [posttest] answers" (p. 69).

For UVC 120, the question of whether students could learn the concepts and techniques taught in the course better in a traditional classroom is moot, because the course was never offered in a traditional format. Indeed, two aspects of this distance course that makes it attractive to students is convenience and the flexibility to fit course work into their schedules rather than schedule their lives around class times. This is a "significant" difference to students, one that affords the library the opportunity to teach research skills to a new audience on their own terms. The measures of success that will be considered in this article are learner outcomes (performance on assignments and grades) as well as student attitudes and satisfaction.

Table 4 indicates overall course performance for the three academic quarters during 1999-2000 for a total of 494 enrolled students. Roughly 90 percent of students attained passing grades each quarter, with the number of drops after the course began limited to around 10 percent, considerably lower than the 30 to 50 percent drop rates cited in some studies of distance education (Cornell & Martin, 1997, p. 93; Carr, 2000). In a report from a year-long faculty seminar on distance learning at the University of Illinois (1999), it was noted that "by using a self-paced, asynchronous online approach with plenty of opportunity for the review of difficult material, retention of remedial students was much higher than in a traditional classroom." Perhaps course methodology for UVC 120 may be related to a relatively low dropout rate.

Table 4. Course Data Summary.

	Fall 1999	Wtr 2000	Spr 2000
Number enrolled	225	182	87
Class rank = freshman	76%	64%	54%
College = University College	92%	91%	84%
Number of drops during course	21 (9%)	17 (9%)	1 (1%)
Number passing	182 (89%)	142 (87%)	78 (90%)
Number failing	22 (11%)	21 (13%)	8 (9%)
Number of failures with no work	11	11	2
Number incomplete	0	2 (1%)	0

PERFORMANCE ON COURSE ASSIGNMENTS

Table 5 shows section averages for course assignments over three quarters. The percentage of correct answers (out of 100 percent) is indicated for specific assignments, along with a weekly average for each group of assignments. These assignments were reasonably consistent from quarter to quarter, although specific test and worksheet questions were revised when analysis of student answers indicated possible confusion or lack of clarity.

In Fall 1999, the course was offered with a Satisfactory/Unsatisfactory grading option at the request of University College. Some students simply stopped completing assignments or did them in a haphazard manner once they had attained enough points to receive a Satisfactory grade, as averages for the third group of assignments (56 percent) in the Fall demonstrate. In later quarters, a regular letter grade (A – E) option was used. Because of the difference in grading strategies, it is more useful to compare Winter and Spring quarter averages in Table 5.

In Winter 2000, the Web site evaluation worksheet (65 percent) and the test on the "Using Web Search Tools" tutorial (66 percent) were the

Table 5. Performance on Assignments.

Assignment	Section Averages		
	Fall 99	Wtr 00	Spr 00
Test: Getting Started (optional)	83%	77%	83%
Test: Browser	79%	83%	89%
Test: E-Mail	87%	81%	88%
Test: Online Groups	75%	75%	79%
Test: OSU Sites	82%	82%	91%
Worksheet: Campus and Course Tools	85%	85%	90%
WEEK 1 OVERALL AVERAGE	82%	81%	87%
Test: Searching 101	63%	70%	77%
Test: Web Search	63%	66%	75%
Test: OSCAR	76%	75%	83%
Worksheet: Web Search	80%	73%	76%
Worksheet: Library Databases	80%	74%	81%
Worksheet: Adv. Web Search (optional)	55%	60%	n/a
WEEK 2 OVERALL AVERAGE	70%	70%	78%
Test: Research Strategy	65%	74%	82%
Test: Web Site Evaluation	64%	75%	81%
Test: Citing Sources	50%	73%	80%
Worksheet: Research Strategy	57%	68%	76%
Worksheet: Web Site Evaluation	54%	65%	73%
Worksheet: Citing Sources	45%	70%	71%
WEEK 3 OVERALL AVERAGE	56%	71%	77%
Capstone Exercise	n/a	75%	71%
AVERAGE OF ALL ASSIGNMENTS	70%	69%	74%

most difficult required assignments for students. In Spring, these assignments were again among the most difficult, although Spring section average scores improved somewhat.

Was one type of assignment more difficult for students than another? The tests are "open book" quizzes, where links to open the related tutorial are provided and questions relate directly to the practice questions or text in the tutorial. Thus one might expect that average test scores would be consistently higher than those for online worksheets, which require students to put concepts and techniques into practice. In Spring quarter, this expectation was borne out. However, Winter quarter students performed better on worksheets during the first two weeks of the course. During the third week, this trend reversed itself.

A Capstone Exercise, requiring students to demonstrate their ability to evaluate Web sites and search for specific information, was introduced in Winter 2000. Unlike other course assignments that employ multiple-choice questions that are graded automatically, this assignment requires students to write short answers and brief paragraphs, which are then evaluated by course instructors. Average performance on this assignment was 75 percent in Winter and 71 percent in Spring.

Evaluation of Web sites seems to be the most difficult piece of the puzzle for students to solve. In the first part of the Capstone assignment, students are asked to evaluate a Web site chosen by instructors. Questions related to the primary purpose of this site (information versus advocacy) have proven consistently difficult for students to answer correctly, even though the sites used are from easily identifiable advocacy groups (such as Amnesty International USA) or are clear examples of informational sites from publishers or universities.

Finally, looking at the average of all assignments for each of the sections, Fall and Winter quarter student performance was similar (approximately 70 percent), while Spring quarter overall performance improved to 74 percent. Some of this improvement may be attributed to the fact that fewer Spring quarter students were freshmen (54 percent) and thus had more familiarity with the campus computing environment and perhaps better study habits. Also, a new process for registering for the course was initiated for the Spring quarter. Students were required to register in person rather than online. This additional hurdle may have discouraged some less motivated students from taking the course in the Spring.

FINAL COURSE GRADES

The following tables examine the relationship of gender, class rank, and previous experience to final grades for the course. Table 6 compares final grades by student gender for Winter and Spring 2000. In both quarters, the distribution by gender for those receiving a grade of A roughly matched the distribution by gender of the student population for the course. That is, in Winter, 56 percent of students were male and 40 percent female (gender could not be determined from the student's name for 4 percent of students). Of those earning a grade of A in Winter, 57 percent were males and 37 percent were females. The same type of pattern prevailed in the Spring for those receiving an A. Males were more highly represented at the low end of the grading scale (D or E) in both quarters.

Table 6. Grade Distribution by Gender.

Gender	% of total		Grade A		Grade B		Grade C		Grade D		Grade E	
	Wtr	Spr	Wtr	Spr	Wtr	Spr	Wtr	Spr	Wtr	Spr	Wtr	Spr
Male	56%	58%	57%	55%	46%	71%	43%	43%	75%	50%	62%	75%
Female	40%	38%	37%	42%	50%	29%	57%	57%	25%	50%	33%	13%
Unknown	4%	4%	6%	4%	4%	0%	0%	0%	0%	0%	5%	13%

Although students in rank 1 (freshmen) heavily dominate enrollment in all three quarters, students at every other rank (including non-degree, graduate, and professional students) have also registered for the course. Table 7 compares distribution of final grades for each level. Again, in both

quarters, the distribution by rank for those receiving a grade of A roughly matched the general pattern of enrollment. In both Winter and Spring, roughly two-thirds (64 percent) of students were freshmen. In Winter, 58 percent of students who received an A were freshmen; in Spring, 62 percent of students earning an A were freshmen. One might expect students of higher rank to do better in this course because they are more acclimated to the university computing environment. As Table 7 indicates, new students were more strongly represented at the low end of the grading scale (D or E).

Table 7. Grade Distribution by Rank.

Rank	% of total		Grade A		Grade B		Grade C		Grade D		Grade E	
	Wtr	Spr	Wtr	Spr	Wtr	Spr	Wtr	Spr	Wtr	Spr	Wtr	Spr
Rank 1	64%	64%	58%	62%	67%	50%	86%	100%	75%	67%	81%	75%
Rank above 1	36%	36%	42%	38%	33%	50%	14%	0%	25%	33%	19%	25%

A third filter for viewing grade distribution for this course is prior Internet experience. Beginning in Spring 2000, UVC 120 students completed a survey when registering. One question asks them to characterize their previous experience using Internet tools (the Web browser and e-mail). Response choices are "little or no experience," "moderate," or "extensive experience." The majority of students (68 percent) characterized their previous experience as moderate, while only 7 percent noted that they had little or no previous experience. Figure 1 depicts the distribution of final course grades for each of these three groups during the Spring quarter.

One might assume that students who had some prior Internet experience would be more likely to succeed in an online course than those who had this additional learning task. Those students with little or no prior experience are fairly evenly distributed across the grade spectrum from A to D, although none failed the course. Of those with moderate prior experience, 55 percent earned either an A or B grade. Those with moderate experience were also more likely to fail. Overall, 9 percent (eight students) failed the course in Spring quarter. Seven out of eight individuals who failed were in the "moderate" experience group. This may be related to the ambiguity of the survey question. Since no quantifiers were offered to help students make this judgment about their prior experience, the moderate experience group is quite likely to include some students who really belong in the little/no experience category.

STUDENT ATTITUDES

Each quarter, students in UVC 120 are encouraged to complete an anonymous online course evaluation at the end of the four-week session. Response rates have varied from 31 percent of those enrolled during Fall

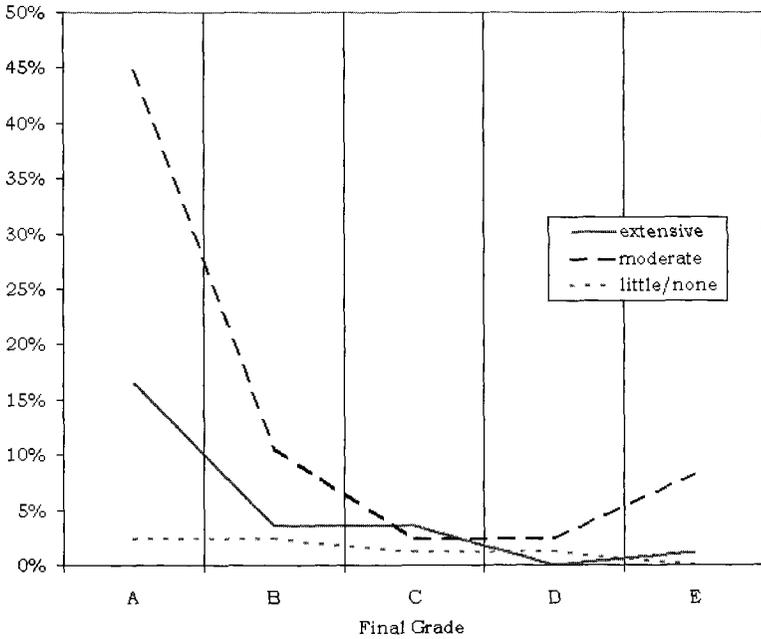


Figure 1. Final Grades by Prior Experience Level.

and Winter quarters to 54 percent in Spring. Evaluations provide demographic information (student rank, grade point average, and OSU College affiliation), reason for enrolling and student perceptions of course management, content, their own learning, and the overall value of the course in their college curriculum. Table 8 shows questions and responses to three questions related to course management and content.

One important aspect of course management for an online course is the ability to distribute adequate information about the course to students so that they can begin successfully. In a traditional course, this is not difficult to accomplish. Students learn the class location from a schedule, attend class on the first day, and receive important information, usually contained in a syllabus from the instructor. In an online course with no required meetings, it is quite difficult to ensure that basic information (for example, the URL of the course Web site and instructor contact information) is distributed to all before the course begins.

Until Spring 2000, Ohio State students registered for UVC 120 in the same manner as other classes, using a computerized registration program named BRUTUS. The master schedule of classes that students consult to learn the room location for a traditional course did not provide the Web address for the online course. Academic advisors either did not have access

Table 8. Course Evaluation—Management and Content.

Q. Adequate information available to begin course			
	Fall 1999	Wtr 2000	Spr 2000
Strongly agree	43%	39%	60%
Moderately agree	38%	40%	23%
Neutral	12%	16%	13%
Moderately disagree	4%	5%	4%
Strongly disagree	3%	0%	0%
Q. Course subject matter was well organized			
	Fall 1999	Wtr 2000	Spr 2000
Strongly agree	54%	63%	55%
Moderately agree	39%	30%	38%
Neutral	4%	7%	6%
Moderately disagree	3%	0%	0%
Strongly disagree	0%	0%	0%
Q. net.TUTOR tutorials appreciably aided learning			
	Fall 1999	Wtr 2000	Spr 2000
Strongly agree	49%	63%	55%
Moderately agree	41%	28%	36%
Neutral	10%	9%	9%
Moderately disagree	0%	0%	0%
Strongly disagree	0%	0%	0%

to this information or were inconsistent in sharing it with students. After changing course registration procedures in Spring 2000 to require students to register in-person (and receive handouts at that time), student perceptions that they had received sufficient information to begin the course improved significantly.

Each quarter, 93 percent of respondents felt that the course subject matter was well organized. Similarly, approximately 90 percent of respondents each quarter agreed that the tutorials used as an e-text for the course were helpful. About 10 percent of respondents were neutral on this question. Since almost one-fourth of enrollees in Spring characterized their prior Internet experience as significant, it is not surprising that some may have found little benefit in the tutorials. As one student stated in the comment space of the evaluation form, "I feel that I didn't learn too much from the course. I have years of previous Internet experience, however, so I simply already knew most of the information covered." This student may have registered for this course simply to fill a one hour schedule gap. It is also reasonable to suspect that the preferred learning styles of some portion of the neutral respondents were not well supported by the predominantly visual online tutorials.

Table 9 provides additional data from student course evaluations. Approximately 90 percent of respondents each quarter agreed that the course met its goal—i.e., to develop the skills needed to use the Internet effectively. Opinion varied on whether the UVC 120 course will help them succeed in other OSU courses. Between 19 and 33 percent of respondents were neutral on this question. Some of this response may be attributed to the fact that relatively few courses require students to do independent research. Some may be due to the hesitancy of instructors to allow students to use Internet resources in research projects. And finally, since many students are freshmen, they may not yet know much about the other courses they will be required to take and so be unable to formulate a response to this question.

Table 9. Course Evaluation—Learning and Course Value.

Q. Course developed skills to use Internet effectively			
	Fall 1999	Wtr 2000	Spr 2000
Strongly agree	39%	46%	56%
Moderately agree	49%	45%	36%
Neutral	7%	5%	9%
Moderately disagree	6%	2%	0%
Strongly disagree	0%	2%	0%
Q. Course will help me succeed in other OSU courses			
	Fall 1999	Wtr 2000	Spr 2000
Strongly agree	22%	34%	30%
Moderately agree	38%	38%	49%
Neutral	33%	20%	19%
Moderately disagree	4%	5%	0%
Strongly disagree	0%	2%	0%
Q. I learned a great deal from this course			
	Fall 1999	Wtr 2000	Spr 2000
Strongly agree	23%	26%	43%
Moderately agree	49%	42%	47%
Neutral	17%	25%	11%
Moderately disagree	7%	7%	0%
Strongly disagree	4%	0%	0%

Student perceptions of their own learning improved significantly in Spring 2000, with almost 90 percent of respondents indicating that they learned a great deal. This may be a reflection, to some extent, of improvement over time in our ability to manage the course and enhancements to various assignments.

Johnson, Aragon, Shaik, and Palma-Rivas (2000) analyzed learner satisfaction and learning outcomes for online and face-to-face learning

environments in a recent article. They cite studies that indicate that on-line students are most satisfied when courses offer flexibility, when the technology functions reliably, and when the instructor acts as a facilitator (p. 32). The authors also note that: "In terms of learning, the frequency or depth of exclusive student/instructor interaction may have some bearing on how much students feel they have gleaned from the course" (p. 45). Instructor/student communication is a critical component of any course, but particularly so in an asynchronous self-paced online course such as UVC 120. The instructors in UVC 120 initiated regular contacts by e-mail with students as a group and individually and also responded to individual student e-mail questions or phone calls promptly (usually the same day). This accessibility was frequently noted in the student comment portion of evaluations. Issues related to course communication, along with other challenges presented by this course, are discussed more fully in the following pages.

COMMUNICATION CHALLENGES

Teaching an online course presents unique challenges in two important areas—communication and student self-regulation. Communication-related issues that surfaced in this course include:

- lack of critical information needed to contact problem students;
- students not reading their OSU e-mail accounts regularly;
- use and misuse of the course mailing list by students; and
- difficulty in solving certain types of problems using e-mail.

The UVC 120 course begins in the fourth week of the ten week Ohio State academic quarter in order to give students new to the university some time to activate their Internet account and become familiar with reading and sending e-mail using their university accounts. Despite the fact that they had registered for an online course during Fall and Winter quarters, some students had not activated their OSU Internet accounts by the time the course began. These students were not receiving any e-mail from the instructor and were unaware of important information being distributed to students. The course management software utilizes this account information in order to authorize students to view course assignments so that students without OSU Internet accounts were also not able to complete any course work. Because the instructor did not have access to the university's student information system, obtaining local address and phone information in order to contact these students was difficult.

During Fall and Winter quarters, it also became apparent that some students who had activated their OSU Internet accounts were not reading the e-mail sent to their OSU e-mail addresses. Many of these students had other e-mail accounts (America Online, Yahoo Mail, and so on) but were unable to configure their e-mail programs to retrieve e-mail from Ohio

State's pop mail server. The university's technology center also provides an e-mail forwarding service that is easy to set up using a Web-based form, but students did not take advantage of it. The instructors concluded that they could overcome these problems by requiring students to register in-person for the course. This allows instructors to verify that students have activated their Internet accounts, obtain important contact information from them, and assure that basic information about the course, including the requirement to read their OSU e-mail or have it forwarded, is distributed to everyone. This new system, instituted during the Spring quarter, has helped to surmount these critical barriers to communication.

A mailing list is used to facilitate easy communication by the instructor to the students in the course. The manner in which this list is structured and used has changed since the first quarter that the course was offered. At that time, more than 200 students were enrolled in the course and students were asked to subscribe themselves to the list (directions were provided). Some students never succeeded, and many others required help to accomplish this task. The mailing list was set up to allow posting by subscribers without review by the list owner. During Fall quarter, students were required to post a message to the list, either in response to a discussion topic or simply introducing themselves to classmates. This requirement proved to be a strategic mistake. There were 200 students that generated a significant amount of daily traffic on the mailing list. Although it was possible for students to receive their list mail in a daily digest rather than as individual messages, many never succeeded in making this change and were inundated with e-mail from other students. While this did facilitate some students getting to know others taking the course and feeling more connected as a group, it also generated a great deal of frustration. Much of the discussion was not course-related in any way and required frequent interventions by the instructor to resolve conflicts or admonish students about list etiquette. In mid-course, the instructor changed the list configuration to moderated and the problems largely disappeared. Future group discussion assignments will utilize a Web-based forum rather than a mailing list.

Most students did not hesitate to get in touch with the instructor whenever they had problems. Despite the fact that these students were on campus and able to visit or call during the instructor's office hours, most preferred using e-mail for questions and problems. Table 10 provides an overview of student contacts during the Winter quarter.

Despite the fact that 66 percent of these students were able to complete the course without any additional help from the instructor, e-mail is often not the most efficient way to resolve problems for those who do need assistance in an online course. For example, one student sent multiple e-mails of increasing urgency as he became more frustrated at not being able to login to view course assignments. Each message was answered

Table 10. Overview of Student Contacts.

Student contacts	Winter 2000	
	# students	percent
One email message	27	16.4%
Multiple (2-5) emails	24	14.5%
Other mode*	5	3.0%
No contact	109	66.1%
TOTAL	165	100.0%

*Instructors logged 7 telephone calls and 7 visits from students. Many of these students also sent email. Only 5 students used a mode other than email exclusively.

promptly by the instructor, who offered very specific instructions and also encouraged the student to come in to discuss this problem. The instructor was unable to help until she met with him in person and he walked through the steps he was taking to connect to assignments. It quickly became apparent that he was viewing a page on the course Web site that contained an illustration of the entry form on the login page and was repeatedly attempting to click on that image.

STUDENT SELF-REGULATION

Quality on the Line, a recent report on benchmarks for success in distance education from the Institute for Higher Education Policy (2000), includes this comment from an administrator: "Self-directed study, which is prevalent at the graduate level, is being pushed down to the undergraduate level because of online learning" (p. 17). The report seeks to determine the relative importance of the benchmarks presented in a previous study to faculty, administrators, and students at six institutions with strong distance learning programs. Respondents did not strongly support the need for specific time requirements in distance courses, citing capacity of students to pace themselves. "Hard and fast rules on how much work should be accomplished in a specific time period" were viewed as inappropriate. Students highly value the flexibility that online courses afford. One student respondent in the study noted that "I enrolled in an [online] course so I would have the freedom to study at my pace and when I wanted to study. I did everything at my own pace for the first course and I got an 'A.' Therefore, stressing a strict pace is 'not important'" (p. 18). Comments from students in course evaluations for UVC 120 echo this sentiment.

UVC 120 is structured in a manner that permits students great flexibility with regard to assignment completion. A new group of five to six

assignments opens each week, so students cannot complete all assignments during the first week of the course. But they are allowed the full four weeks to finish assignments. Although students are encouraged to keep up a weekly pace, and those who lag behind are contacted individually by the instructors to determine whether they are having problems, none of the assignments are actually due until the final day. Table 11 provides a snapshot of student progress on assignments at the end of week two, the mid-point of the course. During both Winter and Spring quarters, roughly half the students kept pace with the recommended schedule. Approximately one-fourth of students had not begun any assignments, and the remaining one-fourth were somewhat behind.

Table 11. Student Programs at Course Mid-Point.

Assignments completed	Number of students in range			
	Wtr 2000	Percent	Spr 2000	Percent
0	47	27.2%	23	26.7%
1-5	32	18.5%	21	24.4%
6-12	94	54.3%	42	48.8%
TOTAL	173	100.0%	86	100.0%

From a practical viewpoint, forcing students in an online course to adhere to a fixed schedule is difficult. The course management software used for UVC 120 does not provide support for automatic deduction of points for late assignments, so this must be done manually. For a large enrollment course, keeping track of assignments completed late and subtracting points from grades is a significant additional workload for the instructor or teaching assistant. From a pedagogical viewpoint, maintaining a fixed schedule is of dubious value. Of the students in Spring who had done no work at the mid-point of the course, 52 percent received a final grade of A. Procrastination did not seem to affect their ultimate success in the course.

CONCLUSION

By offering an online credit course that helps students improve both computing and information-seeking skills in a format that is convenient and flexible, Ohio State University Libraries is meeting institutional goals for developing student competencies as well as filling a perceived need. Although this course is an elective and thus fulfills no specific curricular requirement, almost 500 students (primarily freshmen) completed the Internet Tools and Research Techniques (UVC 120) course during the 1999-2000 academic year. Timing the course to begin later in the academic quarter gives new students an opportunity to establish their university

computing account and learn about the university's e-mail system. It also allows those students taking the course as a replacement for one that they dropped to begin on an equal basis with everyone else.

The number of students dropping out of the UVC 120 course has been much lower (10 percent) than the rates cited for other distance courses (40 percent). Gender and academic rank seem to bear little relationship to student final grades for the course. Prior Internet experience is difficult to interpret as a factor in success or failure. Thus far, student evaluations of the course indicate that their expectations are being fulfilled. Approximately 90 percent of respondents agreed that the course helped them develop or improve their Internet research skills.

One communication challenge for the instructors has been the difficulty of assuring that all students registered for the course receive the information they need to get started. Requiring that students register in person solved this problem. Students have primarily used e-mail to communicate with the course instructors. More than half were able to complete the course without contacting the instructor (by any method). Apparently information on the course Web site about the course and assignments is presented clearly enough to forestall problems and answer questions for the majority of students.

Students in online courses seem to value highly the flexible timetables for completing assignments. In UVC 120, students are allowed the full four weeks to complete all assignments. About half of these students kept up a weekly pace, while the remainder lagged behind, catching up at the end of the course. There seems to be little benefit, practical or pedagogical, in forcing students to adhere to a strict schedule.

This course is fairly easy to administer for large groups because of the self-paced approach, clear instructions on the course Web site, and use of automatically graded assignments. During the first year the course was offered, enrollment each quarter was limited to a maximum of 200 students, and it was promoted in a cautious manner to avoid over-enrollment. Now that the curriculum has been tested and improved, larger sections will be permitted. During Fall 2000, the expected total enrollment is 500 students. A section for 200 students will be offered during the month of August as a true distance course aimed at new students who wish to complete the course in Summer before they come to campus for the first time. The course will be promoted more aggressively at Summer orientation for new students to increase enrollment. Finally, through an internal grant program, the university recently provided funding for an additional instructor to assist in managing the course and increasing enrollment. Enhanced staffing will enable us to expand on-campus enrollment and reach out to new audiences beyond the boundaries of Ohio State University.

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