

Information Literacy for Three Underserved Ohio Populations

Karen Bruns, Leader of OSU CARES, Outreach/Engagement

Thomas Minnick, Associate Dean of Distance Education

Nancy O'Hanlon, Associate Professor, University Libraries

Patrick Royster,

Brian Williams, Graduate Research Assistant

Purpose:

The intent of this study was to examine the effectiveness of information literacy instruction in ten locations in Ohio. Students targeted for the study were from three commonly underserved populations: minority students, rural/Appalachian students, and nontraditional students. Are students from these populations less likely than majority urban students to have regular access to computers (less likely to have one at home, for example), and less likely to have technological skills that support information literacy instruction?

In the context of helping students to develop needed information literacy skills, this study focused on five conditions related to the general question and the specific underserved populations identified above. These conditions are:

1. Characteristics of the learners in these populations
2. Characteristics of the instructors at several dispersed Ohio learning facilities that work with the subject populations
3. Student assessment/evaluation of a series of learning venues and situations
4. Two online curricula designed to assist learners in acquiring information literacy skills
5. Institutional barriers and enablers that interfere with or promote the acquisition of information literacy skills in the subject populations

The study worked with three general groups of subjects. The first were high school students who were recruited to participate in the study through the Ohio State Academy program. Secondly, the college students at Ohio State were recruited. Although initially first year students were recruited, a number of undergraduates at different levels participated. Non-traditional students were identified as a separate group from this group of students. Third, the instruction

personnel who worked with potential students at dispersed sites around the state through Young Scholars and OSU Extension were a part of the study.

Description of Instruments

The primary tool to be used in this study was USAS 120D, Internet Tools and Research Techniques, a four-week distance-learning course currently being offered by The Ohio State University Libraries for one credit. The course was offered to students for our study during winter and spring quarters 2002. The course utilizes net.TUTOR tutorials (available at <http://gateway.lib.ohio-state.edu/tutor/>) as an online textbook. The course is self-paced and there is very little interaction with an instructor. The main communication used in the course is email and the instructor sends weekly reminders and helpful tips to help keep students on track.

Participants in the study were initially asked to fill out an online survey (see Appendix). The first part consists of ten questions pertaining to their use of the computer. The second part of the survey deals with motivational issues and asks participants to rate how often they do certain activities; with 1 being "I do not do this" and 5 being "I nearly always do this". The last part of the survey is to gather personal information about each student such as race, why he/she is taking the course, and information about their high school.

Participants were then asked to complete a three-part pretest before beginning the course and a three-part posttest upon completion of all course assignments. The test has 50 questions total (each worth 2 points). The questions are multiple-choice, with 4 options (choices) each. Other research indicates that a score of 80 or above on a 100 point scale indicates "proficiency." The test is designed to measure knowledge of the specific concepts and techniques taught in the

course, USAS 120D. So it is appropriately used as a pre/post-test for this particular course, to measure change after instruction.

Each part of the pre/post-tests relates to the information presented during one week of the course. Part One is called Internet Tools and consists of sixteen questions. Part Two is called Searching and consist of seventeen questions. Part Three of the test is called Research Techniques and consists of seventeen questions. The scores on the pretest are used to determine prior knowledge before the course and were then compared with posttest scores to determine knowledge gained and effectiveness of the course.

The USAS 120D course covers skills needed to use the Internet effectively as source for finding information. Each week of the course has a theme to which all assignments and study materials are related. Each week an additional set of assignments were made available to the students with all four weeks of assignments being open during the last week. Each week the students were given a list of Internet readings (net.TUTOR tutorials). These readings provided the needed information to do that week's assignments and answer the questions on the quizzes.

Students were rewarded for completing the survey and pre/post tests with additional extra credit points for each part they completed with a maximum of fifteen points. These points impacted only the students' final grades in the course, not the pretest or posttest scores which were used for this study.

Definition of Terms:

Information Literacy – As defined by The Association of College and Research Libraries (ACRL), information literacy is a set of abilities requiring individuals to recognize when

information is needed and have the ability to locate, evaluate, and use effectively the needed information.

Ohio Appalachian Counties – As defined by the Ohio Department of Development, Ohio’s Appalachian counties include 29 counties, which are: Adams, Athens, Belmont, Brown, Carroll, Clermont, Columbiana, Coshocton, Gallia, Guernsey, Harrison, Highland, Hocking, Holmes, Jackson, Jefferson, Lawrence, Meigs, Monroe, Morgan, Muskingum, Noble, Perry, Pike, Ross, Scioto, Tuscarawas, Vinton, and Washington.

Nontraditional Student – As defined for the purposes of our study, a non-traditional student is any student who is over the age of 24, has been out of high school for four or more years, and not enrolled in college or university during this time.

Locale – As defined by the National Center for Education Statistics, the Locale Code defines how the high school is situated in a particular location relative to 1990 Census populous areas, based on the high school's address. No Locale Codes have been assigned to the outlying areas. The Code translations were used as follows for this study:

1. *Rural/Small town* is made up of the following three categories. Small Town is a town not within an MSA and with a population less than 25,000 and greater than or equal to 2,500 people. Rural, outside MSA is a place with less than 2,500 people and coded rural and outside an MSA by the Census Bureau. Rural, inside MSA is a place with less than 2,500 people and coded rural and inside an MSA
2. *Mid-size city/fringe-* is made up of the following two categories. Mid-size Central City is a Central City of an MSA with a population less than 250,000. Urban Fringe of Mid-Size City is a place within an MSA of a Mid-size Central City and defined as urban by the Census Bureau.
3. *Large city fringe-* Urban Fringe of Large City is a place within an MSA of a Large Central City and defined as urban by the Census Bureau.

4. *Lrg central city* – a Large Central City is central city of a Metropolitan Statistical Area (MSA) with a population greater than or equal to 250,000.

Description of Involved Programs:

The following Ohio State University programs were instrumental in the implementation of this research study.

OSU CARES

The Ohio State University Extension program worked with in this study was OSU CARES (Community Access to Resources and Educational Services) and their distance learning centers. OSU CARES is a jointly funded effort of University Outreach & Engagement and Ohio State University Extension. OSU CARES serves as a catalyst to activate teams of university professionals to address anticipated critical issues to face Ohioans. These teams include new partnerships between OSU Extension and colleges, departments and units of the university.

Through the work of these teams and partnerships, new or enhanced outreach/engagement efforts connect the resources and educational services of the university with the communities the university serves.

The distance learning centers are a product of the OSU CARES initiative and are located in Pike, Noble, and Franklin counties. Each had ready contact with local adults and youth and had a computer lab available for use during the study. In addition the OSU Extension Adventure Central was involved with the study. This center works with inner city and minority youth in Dayton, and had computer lab services.

The Ohio State University Young Scholars Program

The Ohio State University Young Scholars Program is a program of the Office of Minority Affairs that works with talented youth of minority groups that come from low-income

families. A primary mission of Ohio State's Office of Minority Affairs is to offer services and programs, which assist minority students in succeeding at Ohio State. In order to help students realize their fullest potential early in their academic careers, the university created the Young Scholars Program (YSP). YSP was developed in 1988 as a statewide model to increase the number of African-American, Latino/Hispanic-American, Native American and Appalachian students who are prepared to do well in degree programs at four-year institutions of higher learning. Through partnerships with Ohio State and the nine largest urban school districts (Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Lorain, Toledo, and Youngstown) and communities in Ohio, YSP nurtures the enormous potential of its students through academic, personal and career development initiatives.

Each spring, teachers, principals, and guidance counselors nominate sixth-grade students from nine urban school districts. Students are interviewed and selected on the basis of academic performance, test scores, leadership, community involvement, family circumstances, and other factors. All of the students are from low-income families and are members of African-American, Latino/Hispanic-American, Native American and Appalachian minority groups. In addition, a potential Young Scholar must be the first generation in his or her family to graduate from a four-year university or college with a bachelor's degree or beyond.

Public school officials, representatives from Ohio State, and members of the student's community make the final selection of the Young Scholars. The program annually inducts 120 students statewide as pre-young scholars. The students are formally inducted as Young Scholars in the 9th grade. As part of the induction process, Young Scholars are encouraged to attend Ohio State and along with their parents must make a commitment to participate in all elements of the program. Young Scholars must also enroll in college preparatory courses in high school and

maintain a minimum 3.0 GPA. Young Scholars who successfully complete program requirements are guaranteed admission to Ohio State, as well as a financial aid package based on their individual verified need.

The Ohio State University Academy

The Ohio State University Academy was created in response to the S.B. 140 section addressing post secondary enrollment options (PSEOP). This is an opportunity for highly qualified students to enroll in college while still in high school. There are two options available at The Ohio State University: **Option A** - For college credit only. Student and family bear the cost of coursework and books. Does not affect high school grade point average and **Option B** - For both high school and college credit. High school and The Ohio State University will share the cost of students' courses and books. Grades are reported to high school, listed on the high school transcript, and figured into the high school grade point average. With either option, the student has a formal college record. The Ohio State University Academy is a highly selective admissions program. Students may apply for admission during the spring enrollment in the autumn. Ohio State will accept applications for any quarter; however, individual high schools may have different timelines. The university encourages students to apply if they have: a class rank in the top 15 percent of their high school class; and at least a 3.5 cumulative high school grade point average on a 4.0 scale; and outstanding performance on a standardized test; and be pursuing a college prep curriculum. To apply, a student should submit the following materials by the appropriate deadline: The Ohio State University Academy Application, the High School Information Form, Official high school transcripts, Official transcripts of course work completed at any post-secondary institution, \$30 application fee, a 300-word essay, standardized test score reports are required (PSAT, PLAN, ACT, SAT), and the high school counselor or principal must

complete the High School Information Form, including a recommendation. This recommendation should indicate precisely the student's intent and purpose for participating in the program.

Procedure:

The methods used for recruiting students were done in cooperation with The Ohio State University Extension, Young Scholars Program and contacting current students already enrolled in the USAS 120D course at Ohio State. The OSU Extension and the Young Scholars programs had contact with individuals, who fit the profile of participants needed for our study.

Contact was made with the Office of Continuing Education, Office of Enrollment, and Coordinator of the Academy Program to inform them about the study. Several copies of informational and admissions materials were obtained for each program in order to be distributed to site coordinators for recruitment.

Our research team met with the Site coordinators for Extension and Young Scholars separately to discuss the purpose of the study and what was needed from them. At these meeting the site coordinators were shown a version of the USAS 120D course Web. They were given an explanation of the course content. The coordinators were also instructed in the admissions and enrollment procedures. They were informed about deadlines for applications to the University programs and enrollment in the course.

Each of the sites was sent packets of information for recruiting students. These packets included: fliers to advertise for the course, admission applications and brochures for the Academy Program and The Continuing Education Program, and a list of the deadlines for admission and enrollment for winter and spring quarters.

At a later date our graduate student met with the eligible Columbus Young Scholars students and parents to discuss the research project and the benefits of taking a course through the Academy Program during the spring quarter. Informational flyers and admissions applications were distributed for students to enroll and a note was made to send materials for parents to enroll through Continuing Education. Initial enthusiasm about the opportunity was great.

A free non-credit option was also added for students who did not want to enroll and pay for credits, but still wanted to gain knowledge from information presented in the course. This additional site was completed in early January prior to the beginning of winter quarter USAS 120D course.

As the winter quarter deadline approached, a follow-up was done with site coordinators two weeks after the meeting to check on the recruitment process. Most were not having much luck finding interested students and those that did were concerned about the short time frame until the winter deadline (see “Barriers” section for further explanation). A final follow-up was made two days before the deadline.

Recruitment for spring quarter began in early January. More packets of information and admissions materials were sent to the sites. The importance of getting a large number of students to participate in the study was stressed. This quarter, site coordinators called and emailed with more questions and concerns as they worked with perspective students.

Spring quarter also had some changes to the recruiting process and to the course. The Lima Campus of The Ohio State University was asked to participate in the study, as they too offered a section USAS 120D course. This decision was made because Lima is located in a more rural area of the state and has a larger population of nontraditional students.

The course's student survey was also revised to clarify questions about participant characteristics.

Information about high school locale characteristics was found and added to the data and high school information was verified. It was also decided to include participants' ACT scores and class rank percents in the data for additional analysis.

Each of the participants' Pre/Post test score data was verified to make sure it was usable. To determine that it was accurate, the Graduate Research Assistant verified that the Pre-Test was complete before the lesson on the topics were presented and that the Post-Test was not started until all other assignments were done.

At the end of the spring quarter class usability of each students' data was verified. To be a usable set the survey, all three parts of the pretest, and all three parts of the posttest had to be completed. In addition, each part of the pretest had to be completed prior to beginning the section of the course that covered the information being tested. The date and time each student accessed different assignments was available through the WebCT course server and made it easy to verify the time and sequence that assignments were accessed.

Findings:

Overview

Net result of the recruitment for winter quarter through Young Scholars and the Learning Centers was one non-traditional student. This was attributed to limited amount of time for recruitment to make the winter quarter deadline and the fact that many of the high schools were on their winter breaks. This course is popular, and as a result many students enroll through other

recruitment means. Of the entire winter quarter enrollment in the course, we had 42 students complete all parts of the research tools.

The spring quarter recruitment through Young Scholars and the Learning Centers resulted in four minority high school students and one nontraditional taking the course for credit and one nontraditional taking the non-credit option. Of the entire spring quarter enrollment in the course, we had 55 students complete all parts of the research tools.

Our independent variables of the study are the learner characteristics gathered from the study. These include race, age, college rank, locale of high school, standardized test score, high school class rank, sex, and the answers to questions on the surveys regarding computer usage, motivation, and learner attitude. The dependent variable we studied was the change in test score from pre-test to post-test after completing the USAS 120D course.

Our study has a total of ninety-seven complete sets of usable data.

Research Questions/Summary of Data:

1. Characteristics of the learners in the population

Our data set has ninety-seven students with valid data. The following is breakdown of the characteristics of our learners, as they will be used as independent variables.

Frequencies-

1. Do you use a computer?

	Frequency	Percent (out of 97)
Yes	96	99.0%
No	1	1.0%

Almost all of the students (99%) reported that they use a computer.

2. **Where do you most frequently use a computer?** (Please select one)

	Frequency	Percent (out of 97)
HOME	75	77.3
SCHOOL/LIBRARY	13	13.4
WORK	8	8.2

The majority of respondents (77.3%) responded that the most frequent location where they use a computer is at home. For 13.4%, they most frequently use the computer at school/library. The smallest percentage of respondents (8%) said they most frequently use the computer at work.

3. **Where do you access the Internet?** (Select all that apply)

	Frequency	Percent (out of 97)
HOME	89	91.7%
FRIEND/RELATIVE'S HOME	36	37.1%
SCHOOL	51	52.6%
LIBRARY	34	35.1%
COMMUNITY CENTER	4	4.1%
OTHER	13	13.4%
I HAVE NEVER ACCESSED THE INTERNET	0	0%

Respondents were able to identify all locations where they access the Internet. Over 90% of the students access the computer at home. Over 50% identified that they access the Internet at school. Only 4.1% identified that they access the Internet at a community center.

4. **How do you use the computer?** (Select all that apply)

	Frequency	Percent (out of 97)
PLAY GAMES	49	50.5%
SEARCH THE INTERNET	90	92.3%
TYPE PAPERS/REPORTS (WORD PROCESSING)	91	93.8%
COMMUNICATION (E-MAIL, CHAT OR DISCUSSION GROUP)	91	93.8%
OTHER	7	7.2%

Over 90% of the respondents stated that they used the computer for word processing, communication or searching the Internet.

5. **If you use the Internet, why do you use it?** (Select all that apply)

	Frequency	Percent (out of 97)
TO DO SCHOOL WORK	92	94.8%
TO DO THINGS FOR MY JOB	27	27.8%
FOR FUN/PLAY	86	88.7%
OTHER	12	12.4%

Over 90% of the respondents stated that they use the Internet to do school work. The second most frequent reason for using the Internet is for fun/play, while less than 30% of the respondents used the Internet to do things related to their job.

5. **How many times a week do you usually use the computer?** (Please select one)

	Frequency	Percent (out of 97)
EVERY DAY	78	80.4%
5-6 DAYS	4	4.1%
3-4 DAYS	11	11.3%
1-2 DAYS	1	1.0%
DO NOT USE A COMPUTER	3	3.1%

Slightly over 80% of the respondents stated that they used the computer every day, while 11.3% stated that they used it 3-4 days a week.

6. **How long do you usually use the computer each time that you use it?** (Please select one)

	Frequency	Percent (out of 97)
LESS THAN 30 MINUTES	15	15.5%
30 - 59 MINUTES	30	30.9%
1 HOUR - 1 HOUR 29 MINUTES	27	27.8%
1 1/2 HOUR TO 1 HOUR 59 MINUTES	7	7.2%
2 HOURS OR MORE	17	17.5%
MISSING	1	1.0%

When asked how long they usually used the computer each time they used it, 30.9% stated that they used it 30-59 minutes at a time. 27.8% stated that they used it 1 hour to 1 hour, 29 minutes at a time. While approximately 15% used it less than 30 minutes at a time and a little over 17% used it 2 hours or more at a time.

7. **Have you taken any classes before this one on using a computer?** (Select all that apply)

	Frequency	Percent (out of 97)
KEYBOARDING	50	51.5%
SEARCHING THE WEB	8	8.2%
USING E-MAIL	9	9.3%
USING SOFTWARE	27	27.8%
COMPUTER PROGRAMMING	21	21.6%
OTHER	6	6.2%

The most common class taken related to using the computer was keyboarding (51.5%). The least common class taken was searching the web (8.2%).

8. **I enjoy working on the computer**

	Frequency	Percent (out of 97)
YES	69	71.1%
NO	1	1.0%
SOMETIMES	27	27.8%

The majority of the respondents stated that they enjoyed working on the computer (71.1%) while only 1% of the respondents stated that they did not enjoy working on the computer.

I enjoy learning about new things

	Frequency	Percent (out of 97)
YES	85	87.6%
NO	0	0%
SOMETIMES	10	10.3%
MISSING	2	2.1%

87.6% of the respondents stated that they enjoyed learning something new while 10.3% stated that they sometimes enjoy leaning something new.

Activities

Activity	Do not do this Seldom do this Sometimes do this		Nearly always do this Often do this	
	Frequency	Percent	Frequency	Percent
If I have something to finish, even if think it is boring, I will keep working on it.	31	32.0%	66	68.0%
I will skip an extra curricular activity if I have something else I would rather do.	76	78.4%	21	21.6%
I try to do my best	5	5.2%	92	94.8%
I like to learn new things	7	7.2%	90	92.8%
I need to be reminded to practice something I am trying to learn (i.e. a new basketball skill, a musical piece)	10	10.3%	87	89.7%
If something is hard for me to do I will keep working on it until I get it done.	25	25.8%	72	74.2%
If I have a homework assignment that will take two weeks to complete, I start working on it shortly after it is assigned.	66	68.0%	31	32.0%
I can talk myself into doing something I don't like to do.	55	56.7%	42	43.3%

The chart above identifies a number of statements related to how respondents react to certain situations. The responses were summarized into two categories for future use in relationship analysis. One group included all responses to the statements “do not do this”, “seldom do this”,

and “sometimes do this”. The other category was “nearly always do this” and “often do this” responses.

1. **What grade are you in?** (Please select one)

	Frequency	Percent (out of 97)
HIGH SCHOOL	5	5.2%
COLLEGE FRESHMAN	42	43.3%
COLLEGE OTHER RANK	44	45.4%
CONTINUING EDUCATION	5	5.2%
OTHER	1	1.0%

As noted in the chart above, the respondents included a large majority of college students, including 43.3% freshmen and 45.4% other college ranks. While approximately 5% were high school students and another 5% identified themselves as continuing education students

2. **Why are you taking this course?** (Please select one)

	Frequency	Percent (out of 97)
FOR COLLEGE CREDIT	71	73.2%
WANT TO LEARN SOMETHING NEW	14	14.4%
SOMEONE TOLD ME I SHOULD TAKE THIS	7	7.2%
OTHER	5	5.2%

Over 70% of the respondents took the course to gain college credit. 14.4% stated that their primary reason for taking the course was to learn something new.

3. **How large was your high school graduating class?** (Please select one)

	Frequency	Percent (out of 97)
50 or fewer students	1	1.0%
51 - 150 students	26	26.8%
151 - 300 students	30	30.9%
more than 300 students	30	30.9%

As can be noted above, the high school class size of the respondents can be fairly evenly split between larger than 300 students, between 151 and 300 students and 150 students or less.

4. **Answer these two questions only if you are from Ohio.**

The chart below includes a breakdown of where the respondent's high school is located.

A. Please list the Ohio County where you are attending, or graduated from, high school.

	Frequency	Percent (out of 97)
Allen	2	2.1%
Auglaize	3	3.1%
Belmont	1	1.0%
Butler	1	1.0%
Clark	1	1.0%
Clinton	1	1.0%
Cuyahoga	9	9.3%
Darke	1	1.0%
Fairfield	2	2.1%
Franklin	17	17.5%
Geauga	2	2.1%
Guernsey	2	2.1%
Hamilton	5	5.2%
Hardin	1	1.0%
Lawrence	1	1.0%
Licking	1	1.0%
Logan	2	2.1%
Lorain	1	1.0%
Lucas	1	1.0%
Mahoning	2	2.1%
Medina	1	1.0%
Montgomery	5	5.2%
Muskingum	2	2.1%
Noble	1	1.0%
Pike	1	1.0%
Richland	1	1.0%
Shelby	1	1.0%
Stark	2	2.1%
Summit	6	6.2%
Warren	1	1.0%
Wayne	1	1.0%

5. **What is your gender?**

	Frequency	Percent (out of 97)
MALE	38	39.2%
FEMALE	59	60.8%

The majority of the respondents to the survey were female (60.8%).

6. **What is your age to the nearest year?**

	Frequency	Percent (out of 97)
16	1	1.0%
17	2	2.1%
18	9	9.3%
19	31	32.0%
20	10	10.3%
21	13	13.4%
22	11	11.3%
23	1	1.0%
24	3	3.1%
25	1	1.0%
27	1	1.0%
28	2	2.1%
32	2	2.1%
34	4	4.1%
35	1	1.0%
36	1	1.0%
37	1	1.0%
41	1	1.0%
42	1	1.0%
54	1	1.0%

The largest percentage of respondents stated that they were 19% years of age (32%).

7. **Race:** (Please select one)

	Frequency	Percent (out of 97)
Asian	8	8.2%
Black/Hispanic	17	17.5%
White	72	74.2%

The majority of the respondents identified themselves of white race (74.2%)

Traditional or Non-Traditional student?

	Frequency	Percent (out of 97)
Traditional	82	84.5%
Non-Traditional	15	15.5%

84.5% of the respondents were traditional students and 15.5% were non-traditional based on the definition used for this study.

Describe the area you live in.

	Frequency	Percent (out of 97)
<i>Rural Small Town:</i> Rural, inside MSA; Rural, outside MSA; Small Town	23	23.7%
<i>Mid-size city/fringe:</i> Mid-Size City; Urban Fringe of Mid-Size City	20	20.6%
<i>Large city fringe:</i> Urban Fringe of Large City	22	22.7%
<i>Lrg central city:</i> Large Central City	12	12.4%
<i>Missing</i>	20	20.6%

Based on the location of the respondent’s high school, the chart above identifies the locale for each respondent based on the definition identified for this study.

QTR Enrollment quarter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Winter	42	43.3	43.3	43.3
	2 Spring	55	56.7	56.7	100.0
	Total	97	100.0	100.0	

As noted earlier, 97 students participated in this study.

ACT ACT Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	14	1	1.0	1.1	1.1
	16	1	1.0	1.1	2.2
	17	1	1.0	1.1	3.4
	18	2	2.1	2.2	5.6
	19	3	3.1	3.4	9.0
	20	3	3.1	3.4	12.4
	21	6	6.2	6.7	19.1
	22	10	10.3	11.2	30.3
	23	10	10.3	11.2	41.6
	24	5	5.2	5.6	47.2
	25	7	7.2	7.9	55.1
	26	3	3.1	3.4	58.4
	27	11	11.3	12.4	70.8
	28	3	3.1	3.4	74.2
	29	2	2.1	2.2	76.4
	30	2	2.1	2.2	78.7
	31	2	2.1	2.2	80.9
	32	2	2.1	2.2	83.1
	33	1	1.0	1.1	84.3
	97	1	1.0	1.1	85.4
	98	6	6.2	6.7	92.1
	99	7	7.2	7.9	100.0
	Total	89	91.8	100.0	
Missing	System	8	8.2		
Total		97	100.0		

This data was compiled from university enrollment information, but the preliminary statistical analysis that was done showed no significance. Therefore it did not warrant further study because it did not relate to the main purpose of the study.

RANKPCT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10.4	1	1.0	1.5	1.5
	13.7	1	1.0	1.5	3.0
	33.6	1	1.0	1.5	4.5
	35.3	1	1.0	1.5	6.1
	36.2	1	1.0	1.5	7.6
	40.0	1	1.0	1.5	9.1
	40.5	1	1.0	1.5	10.6
	44.7	1	1.0	1.5	12.1
	48.1	1	1.0	1.5	13.6
	48.5	1	1.0	1.5	15.2
	48.9	1	1.0	1.5	16.7
	49.7	1	1.0	1.5	18.2
	53.3	1	1.0	1.5	19.7
	54.1	1	1.0	1.5	21.2
	55.2	1	1.0	1.5	22.7
	57.4	1	1.0	1.5	24.2
	59.1	1	1.0	1.5	25.8
	59.8	1	1.0	1.5	27.3
	61.2	1	1.0	1.5	28.8
	63.0	1	1.0	1.5	30.3
	65.6	1	1.0	1.5	31.8
	66.3	2	2.1	3.0	34.8
	69.0	1	1.0	1.5	36.4
	70.0	1	1.0	1.5	37.9
	74.2	1	1.0	1.5	39.4
	76.0	1	1.0	1.5	40.9
	76.8	1	1.0	1.5	42.4
	77.5	1	1.0	1.5	43.9
	77.8	1	1.0	1.5	45.5
	78.6	1	1.0	1.5	47.0
	78.7	1	1.0	1.5	48.5
	79.1	1	1.0	1.5	50.0
	79.4	1	1.0	1.5	51.5
	79.6	1	1.0	1.5	53.0
	81.0	1	1.0	1.5	54.5
	82.4	1	1.0	1.5	56.1
	85.4	1	1.0	1.5	57.6
	85.8	1	1.0	1.5	59.1
	86.2	1	1.0	1.5	60.6
	87.5	1	1.0	1.5	62.1
	87.8	1	1.0	1.5	63.6
	88.3	1	1.0	1.5	65.2
	88.5	1	1.0	1.5	66.7
	90.8	1	1.0	1.5	68.2
	91.4	1	1.0	1.5	69.7
	91.8	1	1.0	1.5	71.2
	92.3	1	1.0	1.5	72.7
93.0	1	1.0	1.5	74.2	
93.6	1	1.0	1.5	75.8	
93.9	1	1.0	1.5	77.3	
94.5	1	1.0	1.5	78.8	
94.8	1	1.0	1.5	80.3	
94.9	1	1.0	1.5	81.8	
95.1	1	1.0	1.5	83.3	
95.2	2	2.1	3.0	86.4	
95.6	1	1.0	1.5	87.9	
95.8	1	1.0	1.5	89.4	
96.0	1	1.0	1.5	90.9	
98.0	1	1.0	1.5	92.4	
99.2	1	1.0	1.5	93.9	
99.3	1	1.0	1.5	95.5	
99.4	1	1.0	1.5	97.0	
99.5	1	1.0	1.5	98.5	
99.7	1	1.0	1.5	100.0	
Total		66	68.0	100.0	
Missing	System	31	32.0		

This data was compiled from university enrollment information, but the preliminary statistical analysis that was done showed no significance.

The following frequency tables are those of the final grades in the course, pretest scores, posttest scores, and change in pre/post test scores. These were used as the dependent variables in the data analysis of our study.

GRADE Final grade (numeric)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 D+, D, D-	3	3.1	3.1	3.1
	2 C+, C, C-	2	2.1	2.1	5.2
	3 B+, B, B-	5	5.2	5.2	10.4
	4 A, A-	86	88.7	89.6	100.0
	Total	96	99.0	100.0	
Missing	System	1	1.0		
Total		97	100.0		

The majority of the class did quite well with most getting an A (89.6%) or B (5.2%) grade. The one missing grade is that of our student enrolled in the non-credit version of the course.

FINAL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A-	5	5.2	5.2	5.2
	A	81	83.5	83.5	88.7
	B	1	1.0	1.0	89.7
	B+	4	4.1	4.1	93.8
	C+	2	2.1	2.1	95.9
	D	2	2.1	2.1	97.9
	D+	1	1.0	1.0	99.0
	noncr	1	1.0	1.0	100.0
Total		97	100.0	100.0	

As noted above the class as a whole was very successful in the course.

PRETEST PART 1

	Frequency	Percent	Valid	Cumulative Percent
Valid 0	1	1.0	1.0	1.0
4	1	1.0	1.0	2.1
8	3	3.1	3.1	5.2
10	5	5.2	5.2	10.3
12	2	2.1	2.1	12.4
14	10	10.3	10.3	22.7
16	8	8.2	8.2	30.9
18	8	8.2	8.2	39.2
20	16	16.5	16.5	55.7
22	13	13.4	13.4	69.1
24	13	13.4	13.4	82.5
26	9	9.3	9.3	91.8
28	5	5.2	5.2	96.9
30	3	3.1	3.1	100.0
Total	97	100.0	100.0	

The scores on Part 1 of the pretest are shown in the table above. Note that there are no perfect scores (32).

POSTTEST PART 1

	Frequency	Percent	Valid	Cumulative Percent
Valid 6	2	2.1	2.1	2.1
14	1	1.0	1.0	3.1
16	3	3.1	3.1	6.2
18	9	9.3	9.3	15.5
20	14	14.4	14.4	29.9
22	10	10.3	10.3	40.2
24	4	4.1	4.1	44.3
26	13	13.4	13.4	57.7
28	21	21.6	21.6	79.4
30	13	13.4	13.4	92.8
32	7	7.2	7.2	100.0
Total	97	100.0	100.0	

The scores on Part 1 of the posttest are shown in the table above. Note that there are 7 perfect scores (32).

PRETEST PART 2

	Frequency	Percent	Valid	Cumulative Percent
Valid	8	5	5.2	5.2
	10	6	6.2	11.3
	12	7	7.2	18.6
	14	18	18.6	37.1
	16	17	17.5	54.6
	18	12	12.4	67.0
	20	12	12.4	79.4
	22	6	6.2	85.6
	24	9	9.3	94.8
	26	2	2.1	96.9
	28	2	2.1	99.0
	34	1	1.0	100.0
Total	97	100.0	100.0	

The scores on Part 2 of the pretest are shown in the table above. Note: there are 65 scores below 20 points out of a possible 34 points.

POSTTEST PART 2

	Frequency	Percent	Valid	Cumulative Percent
Valid	10	1	1.0	1.0
	12	6	6.2	7.2
	14	5	5.2	12.4
	16	9	9.3	21.6
	18	6	6.2	27.8
	20	13	13.4	41.2
	22	13	13.4	54.6
	24	10	10.3	64.9
	26	10	10.3	75.3
	28	10	10.3	85.6
	30	10	10.3	95.9
	32	3	3.1	99.0
	34	1	1.0	100.0
Total	97	100.0	100.0	

The scores on Part 2 of the posttest are shown in the table above. Note: there are only 27 scores below 20 points out of a possible 34 points.

PRETEST PART 3

		Frequency	Percent	Valid	Cumulative Percent
Valid	4	1	1.0	1.0	1.0
	8	4	4.1	4.1	5.2
	10	8	8.2	8.2	13.4
	12	13	13.4	13.4	26.8
	14	10	10.3	10.3	37.1
	16	10	10.3	10.3	47.4
	18	17	17.5	17.5	64.9
	20	14	14.4	14.4	79.4
	22	8	8.2	8.2	87.6
	24	5	5.2	5.2	92.8
	26	3	3.1	3.1	95.9
	30	4	4.1	4.1	100.0
Total		97	100.0	100.0	

The scores on Part 3 of the pretest are shown in the table above. Note: there are 75 scores below 22 points out of a possible 34 points.

POSTTEST PART 3

		Frequency	Percent	Valid	Cumulative Percent
Valid	12	2	2.1	2.1	2.1
	14	5	5.2	5.2	7.2
	16	2	2.1	2.1	9.3
	18	7	7.2	7.2	16.5
	20	4	4.1	4.1	20.6
	22	16	16.5	16.5	37.1
	24	11	11.3	11.3	48.5
	26	9	9.3	9.3	57.7
	28	10	10.3	10.3	68.0
	30	15	15.5	15.5	83.5
	32	14	14.4	14.4	97.9
	34	2	2.1	2.1	100.0
	Total		97	100.0	100.0

The scores on Part 3 of the posttest are shown in the table above. Note: there are only 20 scores below 22 points out of a possible 34 points.

PRETEST TOTAL SCORE

	Frequency	Percent	Valid	Cumulative Percent
Valid 32	1	1.0	1.0	1.0
34	5	5.2	5.2	6.2
36	2	2.1	2.1	8.2
38	4	4.1	4.1	12.4
40	5	5.2	5.2	17.5
42	3	3.1	3.1	20.6
44	4	4.1	4.1	24.7
46	8	8.2	8.2	33.0
48	6	6.2	6.2	39.2
50	6	6.2	6.2	45.4
52	5	5.2	5.2	50.5
54	9	9.3	9.3	59.8
56	6	6.2	6.2	66.0
58	3	3.1	3.1	69.1
60	5	5.2	5.2	74.2
62	5	5.2	5.2	79.4
64	5	5.2	5.2	84.5
68	4	4.1	4.1	88.7
70	1	1.0	1.0	89.7
72	1	1.0	1.0	90.7
74	2	2.1	2.1	92.8
76	1	1.0	1.0	93.8
78	1	1.0	1.0	94.8
80	2	2.1	2.1	96.9
82	2	2.1	2.1	99.0
92	1	1.0	1.0	100.0
Total	97	100.0	100.0	

This is a total score of a three parts of the pretest. Note: A total of 67 students scored below 60 points out of a possible 100 points.

PROSTTEST TOTAL SCORE

	Frequency	Percent	Valid	Cumulative Percent
Valid 30	1	1.0	1.0	1.0
40	1	1.0	1.0	2.1
42	1	1.0	1.0	3.1
46	3	3.1	3.1	6.2
48	1	1.0	1.0	7.2
50	3	3.1	3.1	10.3
52	1	1.0	1.0	11.3
54	1	1.0	1.0	12.4
56	1	1.0	1.0	13.4
58	2	2.1	2.1	15.5
60	7	7.2	7.2	22.7
62	4	4.1	4.1	26.8
64	6	6.2	6.2	33.0
66	2	2.1	2.1	35.1
68	4	4.1	4.1	39.2
70	4	4.1	4.1	43.3
72	3	3.1	3.1	46.4
74	8	8.2	8.2	54.6
76	6	6.2	6.2	60.8
78	3	3.1	3.1	63.9
80	8	8.2	8.2	72.2
82	5	5.2	5.2	77.3
84	6	6.2	6.2	83.5
86	2	2.1	2.1	85.6
88	5	5.2	5.2	90.7
90	1	1.0	1.0	91.8
92	5	5.2	5.2	96.9
94	2	2.1	2.1	99.0
96	1	1.0	1.0	100.0
Total	97	100.0	100.0	

This is a total score of a three parts of the posttest. Note: A total of only 15 students scored below 60 points out of a possible 100 points.

Total score change (post-pre)

		Frequency	Percent	Valid	Cumulative Percent
Valid	-10	1	1.0	1.0	1.0
	-4	1	1.0	1.0	2.1
	0	1	1.0	1.0	3.1
	2	3	3.1	3.1	6.2
	4	4	4.1	4.1	10.3
	6	4	4.1	4.1	14.4
	8	1	1.0	1.0	15.5
	10	11	11.3	11.3	26.8
	12	9	9.3	9.3	36.1
	14	10	10.3	10.3	46.4
	16	4	4.1	4.1	50.5
	18	4	4.1	4.1	54.6
	20	7	7.2	7.2	61.9
	22	4	4.1	4.1	66.0
	24	8	8.2	8.2	74.2
	26	3	3.1	3.1	77.3
	28	2	2.1	2.1	79.4
	30	8	8.2	8.2	87.6
	32	4	4.1	4.1	91.8
	34	4	4.1	4.1	95.9
36	1	1.0	1.0	96.9	
38	2	2.1	2.1	99.0	
54	1	1.0	1.0	100.0	
Total		97	100.0	100.0	

This table shows the change in total score from pretest to posttest.

Change group

		Frequency	Percent	Valid	Cumulative Percent
Valid	1 Post score	2	2.1	2.1	2.1
	2 No change (pre-	1	1.0	1.0	3.1
	3 Post score	94	96.9	96.9	100.0
Total		97	100.0	100.0	

This table groups the test score changes from above into three categories. There were only 3.1% of the students, which did not have an increase in test score.

Change Test 1 (post-pre)

		Frequency	Percent	Valid	Cumulative Percent
Valid	-4	1	1.0	1.0	1.0
	-2	9	9.3	9.3	10.3
	0	10	10.3	10.3	20.6
	2	16	16.5	16.5	37.1
	4	19	19.6	19.6	56.7
	6	13	13.4	13.4	70.1
	8	13	13.4	13.4	83.5
	10	9	9.3	9.3	92.8
	12	1	1.0	1.0	93.8
	14	3	3.1	3.1	96.9
	16	2	2.1	2.1	99.0
	32	1	1.0	1.0	100.0
	Total		97	100.0	100.0

This table shows the change in score from pretest Part 1 to posttest Part 1.

Change Test 2 (post-pre)

		Frequency	Percent	Valid	Cumulative Percent
Valid	-6	1	1.0	1.0	1.0
	-4	4	4.1	4.1	5.2
	-2	6	6.2	6.2	11.3
	0	11	11.3	11.3	22.7
	2	14	14.4	14.4	37.1
	4	12	12.4	12.4	49.5
	6	14	14.4	14.4	63.9
	8	13	13.4	13.4	77.3
	10	9	9.3	9.3	86.6
	12	3	3.1	3.1	89.7
	14	6	6.2	6.2	95.9
	16	3	3.1	3.1	99.0
	18	1	1.0	1.0	100.0
Total		97	100.0	100.0	

This table shows the change in score from pretest Part 2 to posttest Part 2.

Change Test 3 (post-pre)

	Frequency	Percent	Valid	Cumulative Percent
Valid -4	2	2.1	2.1	2.1
-2	1	1.0	1.0	3.1
0	8	8.2	8.2	11.3
2	9	9.3	9.3	20.6
4	7	7.2	7.2	27.8
6	12	12.4	12.4	40.2
8	15	15.5	15.5	55.7
10	17	17.5	17.5	73.2
12	11	11.3	11.3	84.5
14	4	4.1	4.1	88.7
16	5	5.2	5.2	93.8
18	5	5.2	5.2	99.0
20	1	1.0	1.0	100.0
Total	97	100.0	100.0	

This table shows the change in score from pretest Part 3 to posttest Part 3.

Analysis

A variety of tests were conducted to determine the level of association between independent variables (characteristics of students) and the dependent variable (change in test scores). A $p \leq 0.05$ was used to indicate a level of significance. In addition, the independent characteristics of race/ethnic, class size, locale and traditional/nontraditional were compared with the other independent variables using two-way analysis of variance to see if there was any level of association. There were very limited significant levels of association with the analysis. Below are listed a sample of the analysis conducted, specifically those that showed the strongest levels of association. A complete listing of the data analyzed is available upon request.

Computer Use:

Total score change (post-pre) * Times/wk use computer

Directional Measures

			Value
Nominal by Interval	Eta	TOT_CHG Total score change (post-pre) Dependent	.145
		PT1.6 Times/wk use computer Dependent	.440

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.125	.074	1.641	.101
	Kendall's tau-c	.087	.053	1.641	.101
N of Valid Cases		97			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

If the student uses the computer more times per week, the test scores appear to go up, but not at a significance level of .05 or less. The significance was $p \leq .101$.

High School Class Size:

HS class size (r) * Where use computer (r)

Crosstab

			PT1.2R Where use computer (recoded)			
			2			
			1 Home	School/Library	3 Work	Total
PT3.3R HS class size (recoded)	1 150 or less	Count	20	3	4	27
		Expected Count	21.3	3.1	2.5	27.0
	2 151-300	Count	24	3	3	30
		Expected Count	23.7	3.5	2.8	30.0
	3 >300	Count	24	4	1	29
		Expected Count	22.9	3.4	2.7	29.0
Total		Count	68	10	8	86
		Expected Count	68.0	10.0	8.0	86.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.296 ^a	4	.682
Likelihood Ratio	2.500	4	.645
Linear-by-Linear Association	1.398	1	.237
N of Valid Cases	86		

a. 6 cells (66.7%) have expected count less than 5. The minimum expected count is 2.51.

There appears to be no significant relationship between the size of the high school class from which the student came, and where they used the computer.

HS class size (r) * Work until job done (r)

Crosstab

		PT2.1R Work until job done (recoded)			
		0 Never/Not often	1 Usually /Always	Total	
PT3.3R HS class size (recoded)	1 150 or less	Count	12	15	27
		Expected Count	9.0	18.0	27.0
	2 151-300	Count	10	20	30
		Expected Count	10.0	20.0	30.0
	3 >300	Count	7	23	30
		Expected Count	10.0	20.0	30.0
Total		Count	29	58	87
		Expected Count	29.0	58.0	87.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.850 ^a	2	.241
Likelihood Ratio	2.870	2	.238
Linear-by-Linear Association	2.815	1	.093
N of Valid Cases	87		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.00.

There does not appear to be a significant relationship between high school class size and their answers as it related to the question “If something is hard for me to do I will keep working on it until I get it done”. This is an example of the limited relationship that was found between high school size and other motivation related questions on the survey.

HS class size (r) * Need to be reminded to practice (r)

Crosstab

				PT2.5R Need to be reminded to practice (recoded)		
				0 Usually /Always	1 Never/Not often	Total
PT3.3R HS class size (recoded)	1 150 or less	Count		4	23	27
		Expected Count		2.8	24.2	27.0
	2 151-300	Count		4	26	30
		Expected Count		3.1	26.9	30.0
	3 >300	Count		1	29	30
		Expected Count		3.1	26.9	30.0
Total		Count		9	78	87
		Expected Count		9.0	78.0	87.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.461 ^a	2	.292
Likelihood Ratio	2.890	2	.236
Linear-by-Linear Association	2.053	1	.152
N of Valid Cases	87		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 2.79.

Again, there was limited relationship between high school size and the questions, “I need to be reminded to practice something I am trying to learn”, it again demonstrates the limited relationship between high school size and the motivation related questions.

HS class size (r) * Avg time use computer

Crosstab

		PT1.7 Avg time use computer						
		1 <30 min	2 30-59 min	3 60-89 min	4 90-119 min	5 120+ min	Total	
PT3.3R HS class size (recoded)	1 150 or less	Count	6	8	7	0	6	27
		Expected Count	4.4	8.8	7.2	1.9	4.7	27.0
	2 151-300	Count	7	6	8	5	4	30
		Expected Count	4.9	9.8	8.0	2.1	5.2	30.0
	3 >300	Count	1	14	8	1	5	29
		Expected Count	4.7	9.4	7.8	2.0	5.1	29.0
Total	Count	14	28	23	6	15	86	
	Expected Count	14.0	28.0	23.0	6.0	15.0	86.0	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.258 ^a	8	.054
Likelihood Ratio	17.300	8	.027
Linear-by-Linear Association	.125	1	.723
N of Valid Cases	86		

a. 7 cells (46.7%) have expected count less than 5. The minimum expected count is 1.88.

There appeared to be a significant difference ($p = .054$) in the average time spent using the computer each time the student used it, as it related to size of the student's high school class.

HS class size (r) * Times/wk use computer

Crosstab

			PT1.6 Times/wk use computer					
			1 Never	2 1-2 da/wk	3 3-4 da/wk	4 5-6 da/wk	5 Daily	Total
PT3.3R HS class size (recoded)	1 150 or less	Count	0	0	3	1	23	27
		Expected Count	.9	.3	3.1	.9	21.7	27.0
	2 151-300	Count	3	0	4	1	22	30
		Expected Count	1.0	.3	3.4	1.0	24.1	30.0
	3 >300	Count	0	1	3	1	25	30
		Expected Count	1.0	.3	3.4	1.0	24.1	30.0
Total	Count	3	1	10	3	70	87	
	Expected Count	3.0	1.0	10.0	3.0	70.0	87.0	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.052 ^a	8	.428
Likelihood Ratio	8.973	8	.345
Linear-by-Linear Association	.052	1	.820
N of Valid Cases	87		

a. 12 cells (80.0%) have expected count less than 5. The minimum expected count is .31.

Although there appeared to be a significant relationship between high school class size and the length of time usually spent on the computer, there was not a significant relationship between high school class size and the number of times a week that the student used the computer.

Locale:

Analysis was conducted concerning the relationship between the local of the student's high school and the other independent variables of the student. There did not appear to be any significant relationships between locale and computer use questions or motivation related questions. Below are two examples of those analyses.

Locale (r) * Need to be reminded to practice (r)

Crosstab

			PT2.5R Need to be reminded to practice (recoded)		
			0	1	
			Usually /Always	Never/Not often	Total
LOC_NUM Locale (recode)	1 Rural/Small town	Count	4	19	23
		Expected Count	2.1	20.9	23.0
	2 Mid-size city/fringe	Count	1	19	20
		Expected Count	1.8	18.2	20.0
	3 Large city fringe	Count	1	21	22
		Expected Count	2.0	20.0	22.0
	4 Lrg central city	Count	1	11	12
		Expected Count	1.1	10.9	12.0
Total		Count	7	70	77
		Expected Count	7.0	70.0	77.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.881 ^a	3	.410
Likelihood Ratio	2.700	3	.440
Linear-by-Linear Association	1.325	1	.250
N of Valid Cases	77		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.09.

Symmetric Measures

		Value	Approx. Sig.
Nominal by	Phi	.193	.410
Nominal	Cramer's V	.193	.410
N of Valid Cases		77	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

There was not a significant ($p \leq .05$) relationship between these variable locale and “I need to be reminded to practice something I am trying to learn.”

Locale (r) * Avg time use computer

Crosstab

			PT1.7 Avg time use computer					
			1 <30 min	2 30-59 min	3 60-89 min	4 90-119 min	5 120+ min	Total
LOC_NUM Locale (recode)	1 Rural/Small town	Count	2	6	8	1	6	23
		Expected Count	4.2	6.7	6.7	1.2	4.2	23.0
	2 Mid-size city/fringe	Count	6	4	5	0	5	20
		Expected Count	3.7	5.8	5.8	1.1	3.7	20.0
	3 Large city fringe	Count	2	10	5	2	2	21
		Expected Count	3.9	6.1	6.1	1.1	3.9	21.0
	4 Lrg central city	Count	4	2	4	1	1	12
		Expected Count	2.2	3.5	3.5	.6	2.2	12.0
Total		Count	14	22	22	4	14	76
		Expected Count	14.0	22.0	22.0	4.0	14.0	76.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.207 ^a	12	.288
Likelihood Ratio	15.056	12	.238
Linear-by-Linear Association	2.565	1	.109
N of Valid Cases	76		

a. 14 cells (70.0%) have expected count less than 5. The minimum expected count is .63.

There does not appear to be a significant relationship ($p \leq .05$) between locale and the length of time that the student usually uses the computer each time that they use it.

Motivation:

Analysis of the total score change as it related to variables related to motivation were conducted. The Eta was used to measure the level of association when comparing nominal level data to interval level data. This was used to compare the total score change to answers to the questions in the survey related to motivation. Each of these characteristics accounted for a very limited amount of change in test scores (less than 3% per characteristic), except for the characteristic related to “I can talk myself into doing something I don’t like to do”, (14% of the variance).

Total score change (post-pre) * Work on long-term assignments immediately (r)

Directional Measures			
			Value
Nominal by Interval	Eta	TOT_CHG Total score change (post-pre) Dependent	.115
		PT2.7R Work on long-term assignments immediately (recoded) Dependent	.462

As an example, the questions “If I have a homework assignment that will take two weeks to complete, I start working on it shortly after it is assigned” accounted for 1.3% (.115²) of the variance in total test score.

Total score change (post-pre) * Can talk self into doing things don't like (r)

Directional Measures			
			Value
Nominal by Interval	Eta	TOT_CHG Total score change (post-pre) Dependent	.374
		PT2.8R Can talk self into doing things don't like (recoded) Dependent	.466

The variable “I can talk myself into doing something I don’t like to do”, accounted for 14% (.374²) of the variance in total score change.

Race:

The race/ethnic characteristics of the students in the study were compared to the other independent variables. There was only one variable “I enjoy working on the computer” that had a significant relationship to race/ethnic identification. Additional data is listed below that show the lack of significant relationships between the variables.

Race/Ethnic Identification (r) * Where use computer (r)

Crosstab

		PT1.2R Where use computer (recoded)				
		2				
		1 Home	School/Library	3 Work	Total	
PT3.7R Racial identification	1 Asian	Count	5	3	0	8
		Expected Count	6.3	1.1	.7	8.0
	2 Black/Hisp	Count	10	3	3	16
		Expected Count	12.5	2.2	1.3	16.0
	3 White	Count	60	7	5	72
		Expected Count	56.3	9.8	6.0	72.0
Total		Count	75	13	8	96
		Expected Count	75.0	13.0	8.0	96.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.404 ^a	4	.078
Likelihood Ratio	7.518	4	.111
Linear-by-Linear Association	1.997	1	.158
N of Valid Cases	96		

a. 4 cells (44.4%) have expected count less than
5. The minimum expected count is .67.

Although not significant at the $p \leq .05$ level, it did have a lower p level than many other variables. The black/Hispanic students had a higher than expected use of the computer at work and school/library and the white students had a higher than expected use of the computer at home.

Race/Ethnic Identification (r) * Enjoy working on computer

Crosstab

		PT1.9 Enjoy working on computer			Total	
		0 No	1 Sometimes	2 Yes		
PT3.7R Racial identification	1 Asian	Count	1	1	6	8
		Expected Count	.1	2.2	5.7	8.0
	2 Black/Hispanic	Count	0	7	10	17
		Expected Count	.2	4.7	12.1	17.0
	3 White	Count	0	19	53	72
		Expected Count	.7	20.0	51.2	72.0
Total		Count	1	27	69	97
		Expected Count	1.0	27.0	69.0	97.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.383 ^a	4	.010
Likelihood Ratio	7.307	4	.121
Linear-by-Linear Association	1.118	1	.290
N of Valid Cases	97		

a. 5 cells (55.6%) have expected count less than 5. The minimum expected count is .08.

There was a significant relationship between racial/ethnic identification and the student's response to enjoying working on the computer.

Race/Ethnic Identification (r) * Times/wk use computer

Crosstab

		PT1.6 Times/wk use computer						
		1 Never	2 1-2 da/wk	3 3-4 da/wk	4 5-6 da/wk	5 Daily	Total	
PT3.7R Racial identification	1 Asian	Count	0	0	1	0	7	8
		Expected Count	.2	.1	.9	.3	6.4	8.0
	2 Black/Hisp	Count	1	1	3	2	10	17
		Expected Count	.5	.2	1.9	.7	13.7	17.0
	3 White	Count	2	0	7	2	61	72
		Expected Count	2.2	.7	8.2	3.0	57.9	72.0
Total	Count	3	1	11	4	78	97	
	Expected Count	3.0	1.0	11.0	4.0	78.0	97.0	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.431 ^a	8	.236
Likelihood Ratio	8.945	8	.347
Linear-by-Linear Association	.740	1	.390
N of Valid Cases	97		

a. 11 cells (73.3%) have expected count less than 5. The minimum expected count is .08.

This demonstrates the limited significant relationship between racial/ethnic identification and time per week using the computer.

Traditional/Non-Traditional:

When traditional and non-traditional students were analyzed as it related to the variables, there was a significant relationship with where the students used computers. Although this was the only significant relationship, other interesting comparisons are listed below.

Trad/Nontrad * Where use computer (r)

Crosstab

		PT1.2R Where use computer (recoded)				
		2				
		1 Home	School/Library	3 Work	Total	
TRADNON Traditional/Nontraditional	1 Traditional	Count	67	12	2	81
		Expected Count	63.3	11.0	6.8	81.0
	2 Nontraditional	Count	8	1	6	15
		Expected Count	11.7	2.0	1.3	15.0
Total		Count	75	13	8	96
		Expected Count	75.0	13.0	8.0	96.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.412 ^a	2	.000
Likelihood Ratio	16.241	2	.000
Linear-by-Linear Association	14.855	1	.000
N of Valid Cases	96		

a. 2 cells (33.3%) have expected count less than 5.
The minimum expected count is 1.25.

There is a significant relationship between traditional/non-traditional student statuses, and where they used computers. Non-traditional students had a higher than expected rate of usage at work, and traditional students had a lower than expected rate of usage at work.

Trad/Nontrad * Avg time use computer

Crosstab

			PT1.7 Avg time use computer					
			1 <30 min	2 30-59 min	3 60-89 min	4 90-119 min	5 120+ min	Total
TRADNON Traditional/Nontraditional	1 Traditional	Count	15	26	24	5	11	81
		Expected Count	12.7	25.3	22.8	5.9	14.3	81.0
	2 Nontraditional	Count	0	4	3	2	6	15
		Expected Count	2.3	4.7	4.2	1.1	2.7	15.0
Total	Count		15	30	27	7	17	96
	Expected Count		15.0	30.0	27.0	7.0	17.0	96.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.193 ^a	4	.056
Likelihood Ratio	10.365	4	.035
Linear-by-Linear Association	7.830	1	.005
N of Valid Cases	96		

a. 5 cells (50.0%) have expected count less than 5.
The minimum expected count is 1.09.

Although not significant at the $p \leq .05$ level, the significance level was only slightly higher for traditional/non-traditional students and the length of time that they usually used the computer at a time. For non-traditional, the category of 120+ minutes was higher than expected.

Traditional/Nontrad * Need to be reminded to practice (r)

Crosstab

		PT2.5R Need to be reminded to practice (recoded)			
		0 Usually /Always	1 Never/Not often	Total	
TRADNON Traditional/Nontraditional	1 Traditional	Count	7	75	82
		Expected Count	8.5	73.5	82.0
	2 Nontraditional	Count	3	12	15
		Expected Count	1.5	13.5	15.0
Total		Count	10	87	97
		Expected Count	10.0	87.0	97.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.802 ^b	1	.179		
Continuity Correction ^a	.776	1	.378		
Likelihood Ratio	1.526	1	.217		
Fisher's Exact Test				.183	.183
Linear-by-Linear Association	1.784	1	.182		
N of Valid Cases	97				

a. Computed only for a 2x2 table

b. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 1.55.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	-.136	.179
	Cramer's V	.136	.179
N of Valid Cases		97	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Although not significant at the $p \leq .05$ level, there was a stronger relationship between these two variables than most other variables in the study.

Traditional/Nontrad * Work on long-term assignments immediately (r)

Crosstab

		PT2.7R Work on long-term assignments immediately (recoded)			
		1		Total	
		0 Never/Not often	Usually /Always		
TRADNON Traditional/Nontraditional	1 Traditional	Count	58	24	82
		Expected Count	55.8	26.2	82.0
	2 Nontraditional	Count	8	7	15
		Expected Count	10.2	4.8	15.0
Total		Count	66	31	97
		Expected Count	66.0	31.0	97.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.765 ^b	1	.184		
Continuity Correction ^a	1.056	1	.304		
Likelihood Ratio	1.681	1	.195		
Fisher's Exact Test				.231	.152
Linear-by-Linear Association	1.747	1	.186		
N of Valid Cases	97				

a. Computed only for a 2x2 table

b. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.79.

Symmetric Measures

		Value	Approx. Sig.
Nominal by	Phi	.135	.184
Nominal	Cramer's V	.135	.184
N of Valid Cases		97	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Again, although not significant, the relationship appeared to be stronger than for many other characteristics of the study.

2. Characteristics of the instructors at several dispersed Ohio learning facilities that work with the subject populations

This research question was set aside in our study due to the number and types of learners that participated. Most of the students taking this class at distance locations had a computer in their home and the instructors were not necessary. Main campus students have access to computers in many locations including home, dorm, libraries and on-campus labs. Therefore there were no instructors used in our study.

3. Student assessment/evaluation of a series of learning venues and situations

Our study assessed the students by giving them a Pretest prior to starting the course to determine the current knowledge and they were given a Posttest of the same question upon completing the course to determine how much knowledge they gained through the course. They also had a series of course assignments and readings followed by a short quiz. The findings of our study show that nearly all students (96.9%) are able to increase their score on the posttest.

4. Two online curricula designed to assist learners in acquiring information literacy

The two online curricula used as research tools for this study were the USAS 120D - Internet Tools and Research Techniques and the USAS 121D – Advanced Online Research. These courses are a sequence, with 121D requiring completion of 120D as a prerequisite.

Our study only focused on the students of 120D; due to the fact that very few of the participants went on to take the 121D course.

We did develop two versions of the USAS 120D course, the normal “for credit” version and free “non-credit” version. The free non-credit version was designed so that adults not pursuing a degree could improve their information literacy skills without spending the money on a college class. This assumption appeared to be wrong, as there was little interest in the non-credit version and of those that did register for non-credit, only one completed. We did have one student, who was denied admittance to the Academy Program; say it was not worth their time if they were not going to get credit, even if it were free.

The following tables and graphs relate the scores obtained on the pretest and posttest given to participants and the amount of change from pretest to posttest.

Correlations

Descriptive Statistics			
	Mean	STD. Deviation	N
PRETOT	53.63	12.69	97
TOT_CHG Total score Change (pre-post)	18.12	10.789	97
Correlations			
		PRETOT	TOT_CHG Total score change (pre-post)
PRETOT	Pearson Correlation	1	-.302**
	Sig. (2-tailed)	.	.003
	N	97	97
TOTCHG Total score change (pre-post)	Pearson Correlation	-.302**	1
	Sig. (2-tailed)	.003	.
	N	97	97

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

These tables show a strong inverse relationship between Pretest Total Score and change in score from Pretest to Posttest. The data above is statistically significant at the $p \leq .05$ level.

Correlations

Descriptive Statistics			
	Mean	STD. Deviation	N
PRETOT	53.63	12.690	97
POSTTEST	71.75	13.959	97
Correlations			
		PRETOT	POSTTEST
PRETOT	Pearson Correlation	1	.676**
	Sig. (2-tailed)	.	.000
	N	97	97
POSTTOT	Pearson Correlation	.676**	1
	Sig. (2-tailed)	.000	.
	N	97	97

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

These tables show strong positive relationship between Pretest Total Score and Posttest Total Score. The data above is statistically significant at the $p \leq .05$ level.

Frequencies

Statistics			
		PRETOT	POSTTOT
N	Valid	97.00	97.00
	Missing	0.00	0.00
Mean		53.63	71.75
Median		52.00	74.00
Mode		54.00	74 ^a
Std. Deviation		12.690	13.959
Skewness		0.59	-0.53
Std. Error of Skewness		0.25	0.25
Kurtosis		0.12	-0.12
Std. Error of Kurtosis		0.49	0.49
Range		60.00	66.00
Minimum		32.00	30.00
Maximum		92.00	96.00
Percentiles	25	45.00	62.00
	50	52.00	74.00
	75	62.00	82.00

a. Multiple modes exist. The smallest value is shown

This table shows the breakdown of the entire class scores on the pretest and the posttest. There is a significant amount of increase from pretest to posttest score Means, Medians, and Percentiles.

5. Institutional barriers and enablers that interfere with or promote the acquisition of information literacy in the subject populations

Journals were received from the Ohio State University faculty/staff who participated in the study. In addition, focus group interviews were conducted with OSU Learning Center and Young Scholars staff who participated in recruiting students for the study. A summary was prepared of these materials, and themes were identified. The following themes surfaced

When using technology, basic human characteristics are a factor

- Relationship Building is an important aspect of this distance learning project
 - Relationships between partners
 - Relationships with those who could influence future students (schools)
 - Relationships with the admissions process at Ohio State
- Communication is complex and needs to be at a maximum level
 - Communication between those recruiting students and the organization's infrastructure needs to be two-way
 - Communication concerning status of students needs to be shared with all who have relationships with those students.
 - When communicating with non-typical students via e-mail, the setting up of an OSU e-mail account is complex, and difficult. Communicating with them just to set it up is complex. If a student is always required to have an OSU e-mail address to participate in a WebCT course, it adds one more level of complexity to taking a distance course.
- Attitudes of potential students
 - Toward technology, new activities, etc.
 - Value toward education

- These could be barriers or enablers

In the focus group discussions and the journals, the need for strong relationships and communication repeatedly surfaced as it related to recruiting students.

Below are listed factors that appear to be barriers and enablers to distance learning for this population.

Barriers to distance learning

- Enrolling students
 - The Academy program is an effective means for enrolling high school students in college courses. For this project, University faculty and staff who may not traditionally work with Admissions and the Academy program were involved with recruiting students. Admissions for the Academy program are similar to the regular admissions process for the university and takes time. The time needed to form relationships with all parties involved (high school to University staff) in getting students enrolled and the communication/training needed to work with the process resulted in this being perceived as a barrier to enrolling students.
- The organizational infrastructure and policies impacting students enrolled in distance learning courses.
 - These can be barriers or enablers. One case where it could be a barrier relates to e-mail addresses. If for security reasons it is necessary for students in a distance courses to use an institutional (Ohio State) e-mail address that could be a barrier, dependent upon how it is handled. If activating the e-mail address is a complicated process, it can be a barrier to distance learning.

- Having ready access to potential students. Has the market been well enough defined, and ease of accessing them been developed?
 - For distance learning with high school students, like with recruitment of regular college students, an understanding of the target audience is necessary for the ease of recruitment of students. This is a sophisticated process in admissions. A similar process would be helpful for distance learning courses targeting high school students.

- Time
 - An extended period of time is needed to recruit students, and to have them successfully complete the University admissions process for the Academy. Additional time was needed to recruit students for winter quarter.
 - For the Academy program, high school policies may require that students express interest or take necessary tests prior to enrollment in a course. This may need to be done in the spring or autumn prior to enrollment. Timing of this project prohibited some students who were interested in this course from taking it. Therefore, sufficient lead-time to help students meet local requirements is necessary.

- Cost
 - Cost of a one credit course was considered a barrier for some

- Having access to computers at home
 - Was perceived by recruiters as a potential barrier for enrollment.

Enablers to distance learning

- Enthusiasm of teacher or influential adult for the potential student (they encouraged/supported student involvement).
- Having staff to recruit students with a willingness to make this happen. If this is a time consuming process, or if institutional barriers are preventing students from enrolling, having a staff member championing the student is essential.
- Using the distance learning as a part of other programs.
 - Programs that support costs of tuition (TOPS, Young Scholars, Academy)
 - Programs for enrollment (Academy and Continuing Education)
 - Built in audiences for recruiters (4-H and Young Scholars)
 - Young Scholars work with students already on enrollment
- Factsheets that detail how to enroll students
 - The complexity of the process for enrollment can vary from program to program (Continuing Education, Academy). Fact sheets for staff conducting the recruitment can be an enabler to assist them in answering questions (along with contact information for gaining additional answers).
- Potential access to computers

A lack of computers at home was seen as a barrier, but availability of computers at a convenient local site was seen as an enabler.

Conclusions:

The data from our study indicates learner characteristics such as, race, high school class size, locale, and tradition/non-traditional have little to no statistically significant impact on performance of students in the USS120 course, here at The Ohio State University. Some of the

data showed the possibility of some relationship between characteristics of the learner and where and how they use computers and access the Internet, which may warrant some potential future studies.

Due to the size of the representative populations in our study it is not feasible to make inferences about the entire rural/Appalachian, minority, or non-traditional populations in regards to their need information literacy on the Internet.

Our study did reveal the difficulties in offering a distance-learning course to these populations. This may provide a guideline for individuals who wish to do future studies in this area.