Hartshorne, R., Miller, G., & Gretes, J. (2009). Examining student perceptions of technology skills before and after an introductory educational technology course: A three-year case study. *International Journal of Technology in Teaching and Learning*, *5*(1), 37–48.

# Examining Student Perceptions of Technology Skills Before and After an Introductory Educational Technology Course: A Three-Year Case Study

Richard Hartshorne & Greg Miller
*University of North Carolina at Charlotte*

John Gretes
*Independent Instructional Design Consultant*

This paper includes the results of a three-year study of education students involved in an introductory educational computer applications course. The overall purpose of this study was to determine the role of access and environmental factors, as well as the effectiveness of a stand alone educational computer applications course in the development of knowledge, skills, and dispositions related to the integration of technology into the classroom. An additional purpose of the study was to examine trends related to basic technology skills of incoming students enrolled in an introductory educational computer applications course. In this study we examined student reactions to a set of 58 items included in a survey at the start of the course and again at the end of the course. The 58 items were organized around specific course topics and basic technology competencies required for teacher certification. Study data examined included student pre- to post-survey gains, demographic data, and reported entry level skills across the three years.

Keywords: instructional technology course, pre-service teachers, technology skills, integration

## INTRODUCTION

Since the dramatic rise in the availability of computers in the classroom and the Internet, teacher education programs have struggled with the problem of providing pre-service and in-service teachers with the skills they need to be able to appropriately utilize technology to perform a variety of teaching tasks. Additionally, they have struggled with the larger question of how to get pre-service and in-service teachers to fully integrate

---

*Richard Hartshorne is an Assistant Professor, John Gretes is a Professor of Instructional Systems Technology, in the Department of Educational Leadership at the University of North Carolina at Charlotte, Charlotte, North Carolina. Gregg Miller is an Instructional Design Consultant in West Henrietta, New York. Please contact Dr. Hartshorne at: rhartsho@uncc.edu*

technology into the classroom so that the students in those classrooms are not only learning more effectively, but are also gaining a set of vital technology skills. Over the past decade and a half a large body of literature has addressed this issue (Betrus & Molenda 2002; Gretes, Firek, & Nason, 1997; Hartshorne, 2006; Joyner, Gretes, & Flowers, 1998; Rockman, 2004; Topper, 2004; Vagle & College, 1995; Voogt & Pelgrum, 2005; Yaghi, 1997; Yildirim, 2000).

Early in the 1990's several researchers called attention to problems and concerns associated with the lack of adequate technology integration into many teacher education programs. Perkins (1992) found that teachers were being trained in much the same way they were in the mid-twentieth century, and this was creating a generation of teachers who would be woefully unprepared for the challenges they would be facing in the classroom. This has been confirmed in several reports, including a report by the U.S. Congress Office of Technology Assessment (OTA) (1995), which showed that in the mid 1990's, American schools had 5.8 million computers in use for instruction and yet a considerable number of teachers reported little or no use of computers for instruction. More significantly, the same report indicated that teachers only used the computer for tasks such as word processing, grading, and drill/skill programs rather than as a tool to solve problems or improve students' critical thinking skills. Other reports have echoed these findings (Cuban, 2001; Cuban, Kirkpatrick, & Peck, 2001; Strudler, McKinney, & Jones, 1999).

In response, teacher education programs have implemented a number of methods for improving the quality of technology use by teachers. First, many teacher preparation programs have incorporated more technology requirements into their programs (Kahn, 1997; National Council for Accreditation of Teacher Education, 1997; Price & Herrera, 2002). Second, accrediting agencies such as National Council for Accreditation of Teacher Education (NCATE) and the International Society for Teacher Education (ISTE) have developed requirements for the integration of technology into teacher education programs (ISTE, 2001; NCATE, 2001). These standards focus on basic technology literacy skills such as word processing and email as well as issues related to the effective integration of technology into the classroom. However, studies indicate that the integration of technology into the classroom continues to be a problem (Cuban, 2001; National Center for Educational Statistics, 1999). Although a wide variety of other reasons can be cited as to why this is the case, one area that persists in the literature, and is of particular interest to teacher education programs, is the perceived lack of preparedness with both technology and integration skills (National Center for Education Statistics, 2000; Stetson & Bagwell, 1999; Strudler, McKinney, & Jones, 1999; Wetzel, 1993). Because of this belief, instruments are continually being developed and implemented to help instructors assess the use of technology among their students as well as the impacts of these instruments on various factors that influence the integration of technology into the teaching and learning environment (Christensen & Knezek, 1998, 2001; Joyner, Gretes, & Flowers; Gretes, Firek, & Nason, 1997; Flowers, Antonak, & Algozzine 1997). In this study, we explored issues influencing the effectiveness of an introductory technology skills and integration course on the development of pre-service and in-service teacher technology and integration skills.

## RESEARCH QUESTIONS

The current study was undertaken to explore and describe factors that influence pre-service teacher performance in an introductory computer applications course, and ultimately, the development of knowledge, skills, and dispositions related to the

integration of technology into the classroom. An additional purpose of the study was to examine trends related to incoming technology skills of students enrolled in an introductory educational computer applications course and to determine the trend--if any—of student entry-level technological competencies. Also, the study sought to determine the effectiveness of an introductory computer applications course at increasing student's knowledge, skills, and dispositions regarding the effective and appropriate integration of technology into the classroom. Our initial hypothesis was that--due to the increased presence of computer and Internet access in society, entry level skills of undergraduate pre-service teachers will increase over time. Additionally, we felt that a number of external factors, such as access, computer platform, and hours dedicated to work, would influence student achievement in the introductory course. However, with increases in entry level technological skills, the influence of these factors on the attainment of appropriate technological knowledge, skills, and dispositions will diminish over time. In an attempt to explore these hypotheses, the study investigated the following specific research questions:

1. To what degree does a standalone educational computer applications course increase pre-service teacher technological skills?
2. What are the primary factors inhibiting the development of appropriate knowledge, skills, and dispositions regarding the integration of technology into the classroom?
3. To what degree, if any, do the incoming technology skills of pre-service teachers increase over time?

## METHODS

### *PARTICIPANTS*

The number of students participating in the three years of the study totaled 311. The first year of the study consisted of 182 students, the second year consisted of 66 students, and the third year of the study included 63 students. The students in all three years of the study were made up of the following teacher certification areas: Birth to Kindergarten (b-k), Kindergarten to Grade 6 (k-6, 10-11 year olds), Grades 6-9 (10-13 year olds), Grades 9-12 (13 to 18 year olds), and other K-12 areas such as art and music (see Table 1).

### *THE COURSE*

The course, designed for graduate and undergraduate students, teaches basic computer skills and addresses numerous issues related to the effective integration of technology into the teaching and learning environment. It is housed in the university's College of Education and as a result, its enrollment consists primarily of students majoring in an education profession. The content outline for the course includes hardware, the Windows Operating System, and Microsoft Office including Word, Excel, Power Point, and Access. In addition, students worked with email and the Internet. The course uses a series of modules that allow students to primarily work at their own pace. A project-based learning approach is implemented and course materials guide the students through the creation of documents that incorporate the most important features of each of the applications addressed. Projects comprise the core of the course and are a significant part of the students' final grade, and are designed to provide a comprehensive assessment of student's knowledge, skills, and dispositions related to the effective integration of technology into the teaching and learning environment.

*Table 1: Demographic Information for Studies I, II, and III*

| Question | Descriptor | % Year 1 | % Year 2 | % Year 3 |
|---|---|---|---|---|
| Certification level | b-k | 6.7 | 13.1 | 21.7 |
| | k-6 | *49.0* | *54.1* | *36.7* |
| | 6-9 | *2.2* | *4.9* | *3.3* |
| | 9-12 | *11.1* | *1.6* | *3.3* |
| | k-12 | *30.9* | *26.2* | *35.0* |
| Subject area of specialization | English | *15.1* | *15.9* | *14.8* |
| | Math | *5.6* | *9.5* | *8.2* |
| | Science | *7.3* | *6.3* | *4.9* |
| | Social Science | *20.7* | *27.0* | *19.7* |
| | Other | *51.4* | *41.3* | *52.5* |
| Race/Ethnicity | African-American | *19.2* | *22.7* | *17.7* |
| | White | *74.6* | *71.2* | *75.8* |
| | Asian Pacific | *0.0* | *1.5* | *3.2* |
| | American Indian | *0.0* | *1.5* | *0.0* |
| | Other | *4.4* | *3.0* | *3.2* |
| Computer access at home or in dorm? | Yes | *70.3* | *65.2* | *88.9* |
| | No | *29.7* | *34.8* | *11.1* |
| If so, what platform | PC | *82.5* | *85.4* | *92.2* |
| | Macintosh | *17.5* | *14.6* | *7.8* |
| Online service? | Yes | *39.1* | *47.8* | *64.8* |
| | No | *60.9* | *52.2* | *35.2* |
| Internet connectivity at home? | Yes | *50.3* | *51.1* | *60.0* |
| | No | *49.7* | *48.9* | *38.2* |
| If USA born, which region? | Northeast | *28.6* | *22.2* | *25.9* |
| | Southeast | *68.5* | *69.8* | *56.9* |
| | Midwest | *1.2* | *4.8* | *12.1* |
| | West | *1.8* | *0.0* | *3.4* |
| | Other (Alaska, etc.) | *0.0* | *3.2* | *1.7* |
| Do you work? If so, how many hours per week? | **Yes** | *84.6* | *77.3* | *84.1* |
| | **No** | *15.4* | *22.7* | *15.9* |
| | 1-5 | *3.1* | *0.0* | *0.0* |
| | 6-10 | *6.9* | *7.8* | *9.4* |
| | 11-15 | *15.7* | *13.7* | *15.1* |
| | 16-20 | *32.1* | *25.5* | *24.5* |
| | More than 20 | *42.1* | *52.9* | *50.9* |

*INSTRUMENTATION AND DATA COLLECTION*

Prior to starting the course, participants were given a self-assessment inventory of basic skills based upon the nine technology competency areas covered in the class. These areas included basic file & document management, operating system basics, word processing and desktop publishing, spreadsheets, databases, networking, e-mail, audio-visual, and multimedia use and development (see Appendix A). Participants were asked to respond "yes" or "no" to each of 58 "Can you…?" items designed to address the objectives of the course and specific technology skills. Coefficient alpha for the instrument was 0.91, indicating good reliability (Gretes, Firek, & Nason, 1997; Joyner, Gretes, & Flowers, 1998). Upon completion of the course, participants were given the same self-assessment inventory. Additionally, the students were each asked to complete a pre- and a post-course survey form. The form requested demographic information such as teacher certification level, academic concentration, ethnic group, level of computer access outside of the classroom, computer platform used outside of the classroom (Macintosh or PC), outside employment, number of hours employed per week, and operating system used on their computer. This process was completed for each year of the study.

## RESULTS AND FINDINGS

*YEAR ONE RESULTS*

Examining the percent gain from pre- to post-surveys and other analyses conducted, several conclusions can be reached with regard to the first year study. First, the survey items show evidence of reliability through internal consistency ($\alpha = 0.91$). This is important as the same instrument was used in each of the three years of the study. Second, the smallest gains from pre- to post-survey were in the Audio-Visual items (average of 26.9 percentage points) and some specific items under Operating System Basics (setting up computers system and connecting peripherals and install/reinstall and update system software and printer drivers). In contrast, the largest gains from pre- to post-survey were in the areas of Word Processing (average of 45.1 percentage points), Spreadsheets (average of 65.4 percentage points), Databases (average of 53.4 percentage points), and Multimedia (average of 53.8 percentage points). It is important to note that these were also the areas of the course in which the majority of class time was dedicated. Additionally, with the exception of Word Processing, these are also items that subjects in the course have the least pre-course experience. Other areas in which students had limited pre-course experience included Operating System Basics and networking. It is interesting to note that, while most areas in which students had limited pre-course experience resulted in the largest increases, this was not the case for items related to Operating Systems Basics. These items included: making more memory available, installing/reinstalling and updating system software and printer drivers, exchanging disks and files among computer platforms, setting up computers systems and connecting peripheral devices, making backup copies of key applications and documents, using self-help resources to diagnose and correct common hardware/printing problems, and installing and upgrading an application. Basic File and Document Management and Word Processing were areas in which subjects reported having the most pre-course experience. Each of these resulted in large gains (average of 43.3 percentage points and 45.1 percentage points, respectively).

*YEAR TWO RESULTS*

In the second year of the study, students in the stand-alone technology course also reported a significant increase in all skill levels. The smallest gains from pre- to post-survey were in the Audio-Visual items (average of 25.3 percentage points) and Operating System Basics (average of 28.8 percentage points). In contrast, the largest gains from pre- to post-survey were in the areas of Spreadsheets (average of 66.8 percentage points), Databases (average of 64.6 percentage points), and Multimedia (average of 66.1 percentage points). As with year 1, these were some of the areas of the course in which the majority of class time was dedicated and with which students had the least pre-course experience. Other areas in which students had limited pre-course experience included Operating System Basics and networking. Each of these resulted in significant skill increases (average of 28.8 percentage points and 48.5 percentage points, respectively). Additionally, Basic File and Document Management and Word Processing, areas in which subjects reported having the most pre-course experience, both resulted in significant skill increases (average of 42.6 percentage points and 36.4 percentage points, respectively).

*YEAR THREE RESULTS*

In the final year of the study, participants reported a significant increase in a number of skill levels. The smallest gains from pre- to post-survey were in the E-mail items (average of 28.1 percentage points), Audio-Visual items (average of 27.1 percentage points), and Operating System Basics (average of 30.8 percentage points). In contrast, the largest gains from pre- to post-survey were in the areas of Spreadsheets (average of 69.1 percentage points), Databases (average of 59.2 percentage points), and Multimedia (average of 51.8 percentage points). As with years 1 and 2, these were some of the areas of the course in which the majority of class time was dedicated and with which students had the least pre-course experience. Another area in which students had limited pre-course experience included networking. Students reported significant skill increases (average of 39.2 percentage points) in this area. Areas in which subjects reported having the most pre-course experience included Basic File and Document Management, Operating System Basics, Spreadsheets, and Word Processing. The largest gains in these areas included Spreadsheets (average of 69.1 percentage points), and the smallest gains were reported for were reported for Basic File and Document Management (average of 34.8 percentage points), Operating System Basics (average of 30.8 percentage points) and Word Processing (average of 40.7 percentage points).

*DIFFERENCES*

*Demographics.* Table 1 includes a comparison of the demographics for years 1, 2, and 3 of the study. Some interesting demographic patterns are identified in the table. The pattern of students taking the introductory technology integration course changed over the three years. While the percentage of students seeking certification in grades 6-9 teachers remained rather consistent, major shifts occurred with other certification areas. The percentage of students seeking certification as Birth through Kindergarten (BK) teachers grew from 6.7 % in year 1 to 3.1 % in year 2, to 21.7 % in year 3. The percentage of students seeking certification as grade 9-12 teachers decreased from 11.1 % in year 1 to 1.6 % in year 2 to 3.3 % in year 3 of the study. This is interesting because, while the number of participants with traditionally lower technological abilities

increased, and those with traditionally higher technological capabilities decreased, we still saw significant increases in the pre- and post- survey scores in many areas. This hints at more significant skill increases than if participant demographics had remained constant over the three years of the study.

*Internet access and computer platform.* It is also important to note that over the three years of the study students' access to computers changed significantly. Student reactions to the statement, "Computer access at home or in the dorm" varied in the three years of the study. In the first year of the study 70.3% responded "yes" while 65.2% responded "yes" in the second year and 88.9% responded "yes" in the third year. This represents an increase of 16.6 % over the three-year period. Also, major changes took place in the type of computer students have at home or in the dorm. During the first year of the study 82.5 % of students reported having PCs while in the third year of the study that percentage increased to 92.2 %. Changes in the reported use of specific operating systems mirrored the shifts in the type of computers students had in the home or dorm. One of the most marked increases reported by students is the access to an online service. During the first year of the study 39.1 % of students reported having access to an online service while during the second year that percentage increased to 47.8 % and then expanded to 64.8 % in the third year. This corresponds with other reports that indicate an increase in Internet access in homes (Horrigan, 2006).

*TRENDS*

*Incoming skills.* Pre- and post-test percentages of positive responses to each of the survey questions were organized into nine categories and the percentage of gain were examined for each of the three years of the study. Some of the major differences identified over the three-year period follow. An overall trend is that students are starting the course with a consistently higher level of reported competence. The percentage of gains increased in several categories including spreadsheet (38, 39, and 40) and database items (41, 42, 43, and 45). More students also reported a higher level of competence during entry into the course in many items in the areas of Basic File and Document Management (items 15, 16, 18. 19, and 20), Operating System Basics (items 23, 25, 26, 27, and 28), Word Processing (items 31 through 36, and 57), and E-mail (items 49 through 54).

*Hours worked.* Although the percentages of students who reported working and going to school has remained fairly stable over the three years, the percentage of those reporting 20 hours of work per week or more increased from 42.1 % during the first year to 50.9 % during the third year of the study. Not surprisingly, students who worked less than 20 hours per week reported higher levels of competence than students who worked more than 20 hours per week in many areas, most prominently the areas of Spreadsheets (an average of 17 percentage points), Databases (an average of 13 percentage points) and E-mail (an average of 12 percentage points).

## IMPLICATIONS AND CONCLUSIONS

This article presents the results of a three-year study which examined students' self-perceptions of basic computer skills. The results from these students noted some significant changes in students' technology skills over the course of three years. First, in each year of the study, students reported significant increases in their perceived technology skills. This indicates that a stand-alone technology course can be useful in providing a foundation for the development of technology skills of preservice and inservice teachers. While there are many additional issues related to the effective

integration of technology into the teaching and learning environment, with increased skills, students often begin to feel more comfortable with technology. Consequently, they tend to be less anxious and their attitudes toward technology becomes more positive (Swain, 2006). These are all important phases in the in the technology integration process. Second, as the study progressed, participants reported increased access and exposure to computers before coming to the course. This second finding is important since it indicates that students coming into future courses will likely have higher perceived technology skills, which will necessitate modification of such a course so as to remain relevant to students and allow them to further increase their technological skills. Additionally, this presents a number of other possibilities. One possibility is that, with incoming students possessing greater technology skills, more time in the course could be spent on skills related to the effective integration of technology into the classroom, such as Technological Pedagogical Content Knowledge (TPCK) (Mishra & Koehler, 2006). This is a necessity for future teachers entering the classroom who will be working with students in a technology age. So, while today's introductory instructional technology course may focus on the development of technology skills, tomorrow's introductory instructional technology course may look very different, continuing to address the development of specific technology skills while spending a majority of course time addressing other issues related to the effective integration of technology into the classroom.

## REFERENCES


Betrus, A. K. & Molenda, M. (2002). Historical evolution of instructional technology in teacher education programs. *TechTrends*, *46*(5), 18-21, 33.

Christensen, R., & Knezek, G. (1998, March). *Parallel forms for measuring teachers' attitudes toward computers*. Paper presented at the Society for Information Technology and Teacher Education (SITE) International Conference, 1998, Washington, DC.

Christensen, R., & Knezek, G. (2001). Instruments for assessing the impact of technology in education. *Computers In The Schools*, *18*(2), 5-25.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Boston: Harvard University Press.

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal, 38*, 813 – 834.

Flowers, C.P., Antonak, R. F., & Algozzine, R. F. (1997, August). *The validity and reliability of a self-assessment instrument for measure basic technology competencies for educators*. Paper presented at the International Conference on Technology and Education, Oslo, Norway.

Gretes, J. A., Firek, H., & Nason, P. (1997, August). Undergraduate teacher education student perceptions of computer competence as a predictor of actual performance. In ICTE Inc., *Changing Practices and Technologies: Decisions Now for the Future, Proceedings of the 1997 14th Annual International Conference on Technology and Education*, Oslo, Norway, (Vol. II, pp. 532-534).

Hartshorne, R. (2006, March). On becoming an innovative teacher: Conceptual development of pre-service teachers' attitudes toward technology and innovation. In D. A. Willis, J. Price, N. E. Davis, & R. Weber (Eds.), *2006 Society for Information Technology and Teacher Education Annual: Proceedings of*

*SITE2006* (pp. 2105-2107). Norfolk, VA: Association for the Advancement of Computing in Education (AACE).

Horrigan, J. (2006). *Home broadband adoption 2006*. Washington, DC: Pew Internet & American Life Project. Retrieved April 3, 2007 from http://www.pewinternet.org/pdfs/PIP_Broadband_trends2006.pdf

International Society for Technology in Education (2001). *National educational technology standards* [On-line]. Available: http://cnets.iste.org/

Joyner, R. E., Gretes, J. A., and Flowers, C. D. (1998, March). Meeting technology competencies for certification: assessment for change. In ICTE Inc., *A Worldwide Network of Learning: Opportunities, Challenges, and Contrasts, Proceedings of the 15h Annual International Conference on Technology and Education*. Santa Fe, New Mexico, pp. 203-205.

Kahn, J. (1997). Technology-rich teacher education: Meeting the NCATE challenge. *Journal of Computing in Teacher Education*, *13*(2), 24-29.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108* (6), 1017-1054.

Moursund, D. (1989). Why are our colleges of education continuing to graduate illiterate teachers? *The Computing Teacher, 16*(9), 21-22.

National Center for Educational Statistics. (1999). *Teacher quality: A report on the preparation and qualifications of public school teachers.* NCES 1999–080. Washington, DC: U.S. Department of Education.

National Center for Education Statistics. (2000). *Public school teachers' use of computers and the Internet*. Washington DC: U. S. Department of Education.

National Council for Accreditation of Teacher Education. (1997). *Technology and the new professional teacher: Preparing for the 21st century classroom.* Washington, DC: Author.

National Counsel for Accreditation of Teacher Education (2001). *NCATE: Program standards* [On-line]. Available: http://www.ncate.org/standard/programstds.htm

Perkins, D. (1992). *Smart schools: Better thinking and learning for every child*. New York: The Free Press.

Price, P. & Herrera, P. (2002, March). Infusing technology into pre-service teacher education: An evolution in methodology. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2002* (pp. 1738-1739). Chesapeake, VA: AACE.

Rockman, S. (2004). Preface: Positioning evaluation and research within PT3 projects. *Journal of Technology and Teacher Education, 12*(2), i-vii.

Stetson, R. & Bagwell, T. (1999). Technology and teacher preparation: An oxymoron? *Journal of Technology and Teacher Education, 7*(2), 145-152.

Strudler, N. B., McKinney, M. O., & Jones, P. (1999). First-year teachers' use of technology: preparation, expectations and reality. *Journal of Technology and Teacher Education, 7*(2), 115-129.

Swain, C. (2006). Preservice teachers' self-assessment using technology: Determining what is worthwhile and looking for changes in daily teaching and learning practices. *Journal of Technology and Teacher Education, 14*(1), 29-59.

Topper, A. (2004). How are we doing? Using self-assessment to measure changing teacher technology literacy within a graduate educational technology program. *Journal of Technology and Teacher Education*. *12*(3), 303-317.

U.S. Congress, Office of Technology Assessment. (1995). *Teachers and technology: Making the connection.* OTA-EHR-616. Washington, DC: U.S. Government Printing Office.

Vagle, R., & College, D. (1995). Technology instruction for pre-service teachers: An examination of exemplary programs. In D. Willis, B. Robin, & J. Willis (Eds.), *Technology and teacher education annual--1995* (pp. 230-237). Charlottesville, VA: Association for the Advancement of Computing in Education.

Voogt, J., & Pelgrum, H. (2005). ICT and curriculum change. *Human Technology*, *1*(2), 157-175.

Wetzel, K. (1993). Teacher educators' use of computers in education. In D. Carey, R. Carey, D. Willis, & J. Willis (Eds.), *Technology and teacher education annual--1993* (pp. 407-410). Charlottesville, VA: Association for the Advancement of Computing in Education.

Yaghi, H. (1997). The role of the computer in the school as perceived by computer using teachers and school administrators. *Journal of Educational Computing Research, 15*(1), 137-155.

Yildirim, S. (2000). Effects of an educational computing course on preservice and inservice teachers: A discussion and analysis of attitudes and use. *Journal of Research on Computing in Education*, *32*(3), 807-840.

## APPENDIX A

EIST 4100 / TECH 4100 Skills Assessment Survey
Please answer the following items:

1. Certification level
   ☐ BK ☐ K-6 ☐ 6-9 ☐ 9-12 ☐ K-12

2. Subject area of specialization
   ☐ English ☐ Math ☐ Science ☐ Social Science
   ☐ Other

3. Race/Ethnicity
   ☐ African-American ☐ White ☐ Asian Pacific
   ☐ American Indian ☐ Other

4. Do you have computer access at home or in dorm?
   ☐ Yes ☐ No

5. If so, what platform?
   ☐ PC ☐ Macintosh

6. Do you have us an online service?
   ☐ Yes ☐ No

7. Do you have Internet Connectivity at home?
   ☐ Yes ☐ No

8. If USA born, which region
   ☐ Northeast ☐ Southeast ☐ Midwest ☐ West
   ☐ Other (Alaska, etc.)

9. Do you work?
   ☐ Yes ☐ No
10. If so, how many hours per week.
    ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ More than 20

Skills Assessment (ability to perform the following functions)

*Basic File and Document Management*

11. Name, save, retrieve, revise a document
12. Use printing options
13. Initialize/format, name/rename floppy disk and hard disks
14. Copy document from hard disk to floppy disk and vice versa
15. Create and name/rename subdirectories/ folders
16. Save, open, place documents inside subdirectories/ folders
17. Open and work with more than one application at a time

*Operating System Basics*

18. Make more memory available
19. Install/reinstall and update system software and printer drivers
20. Exchange disks and files among Macintosh, MS-DOS/Windows, and Apple II computers
21. Set up computer system and connect peripheral devices
22. Make backup copies of key applications and documents
23. Use self-help resources to diagnose and correct common hardware/printing problems
24. Installing and upgrading an application

*Word Processing / Desktop Publishing*

25. Enter and edit text and copy and move a block of text
26. Copy and move blocks of text
27. Change text format and style, set margins, line spacing, tabs
28. Check spelling, grammar, word usage
29. Create a header or footer
30. Insert date, time, page number
31. Add columns to document
32. Insert clip art into document
33. Produce print-based products (i.e. newsletters, brochures, posters, books)
34. Produce electronic slides/overheads

*Spreadsheet*

35. Create a spreadsheet with rows, columns, headings
36. Create/copy formulas and functions to perform calculations
37. Create a graph from spreadsheet data
38. Insert spreadsheet into word processing document

*Database*

39. Use information from an existing database
40. Sort a database by specific fields, add and delete records
41. Create database with multiple fields and records
42. Create custom layouts including columnar reports
43. Insert database fields into word processing document

*Networking*

44. Use a file server (connect/log on, retrieve a program or document, save a document to a specified location)
45. Share files with others on a network
46. Connect to the Internet or an on-line service
47. Use Gopher to browse resources on the Internet
48. Use FTP to send or retrieve files from remote computers

*E-mail*

49. Use electronic mail (compose, send, retrieve, read, respond)
50. Access and use resources on Internet and World Wide Web
51. Upload a test file and send as electronic mail
52. Use specialized e-mail lists relevant to professional information needs
53. Create and use group addresses for electronic mail
54. Read, save, print, reply to, forward e-mail

*Audio-Visual*

55. Set up and operate a videocassette recorder/player and monitor/TV
56. Connect a video output device (i.e. LCD panel) to computer for large screen display
57. Use painting and drawing tools
58. Use digital camera and scanner
59. Use camcorder and edit video from a camcorder
60. Produce a video
61. Set up and operate a videodisk player and TV receiver or monitor

*Multimedia*

62. Use a linear multimedia presentation
63. Use a non-linear hypermedia presentation
64. Plan/produce a linear multimedia presentation
65. Plan/produce a non-linear, hypermedia presentation
66. Use a file compression utility
67. Input and digitize sound from microphone and audiocassette player/recorder
68. Create simple animation