

Computer Literacy: Essential in Today's Computer-Centric World

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Abstract

Computer literacy is a fundamental part of undergraduate curriculum today. Computer literacy is as basic to undergraduate students as the course work in core curriculum in today's computer-centric information age [6]. The number of computers-in-use worldwide is growing, especially in the developing countries [3]. Computers affect every facet of our lives and every sector of the global society. Employers prefer workers who are computer literate because they are more productive and efficient at work than those who are not computer literate. This paper focuses on computer literacy and its benefits to people of all ages – children, teenagers, adults and seniors. I also describe the implementation of computer competency requirement at Belmont Abbey College and the process students follow to satisfy this requirement in order to graduate.

Keywords: computer literacy, computer competency, digital divide

1. Introduction

Andrew Molnar dubbed the term “computer literacy” in 1972 when he was the Director of the Office of Computing Activities at the National Science Foundation <www.dictionary.com>.

“The United States Department of Education in its June 29, 1996 Report to the Nation on Technology and Education entitled *Getting America's Student Ready for the 21st Century: Meeting the Technology Literacy Challenge* defines the computer literacy as ‘Technology literacy is not just knowing how to use technology for word processing, spreadsheets, and Internet access. Fundamentally, it is using the powerful learning opportunities afforded by technology to increase learning in academic subjects and increase students’ skills’” [11].

Computer literacy can be defined as an individual's ability to operate a computer system, have basic understanding of the operating system to save, copy, delete, open, print documents, format a disk, use computer applications software to perform personal or job-related tasks, use Web browsers and search engines on the Internet to retrieve needed information and communicate with others by sending and receiving email. In academics, a computer literate student should be able to apply the knowledge of computer technology to do research and perform tasks related to his major discipline [7].

We live in a computer-centric information age. For many centuries, pen, pencil, paper, and printed books have been the primary mode of writing, reading, and learning. But that mode of writing, reading, and learning is changing in today's computer-centric society. The number of books, journals, magazines, and newspapers that are available online is increasing rapidly. It is possible that online books will replace the printed books and revolutionize the manner in which we read and learn. Electronic books can be updated easily online without having to reprint them and are cheaper in price; many books can be stored on a computer's hard disk because of their huge storage capacity; and a laptop with those e-books is easier and lighter to carry than a backpack full of books and notebooks. However, many people may prefer to read a printed book while relaxing under a tree, or at the beach, or in their bed, which is hard to do with a computer.

Digital divide is the term that means that not everyone in the world has the same access to information technology. People in affluent societies, such as the United States of America and Europe, have faster and better access to Internet and other information and telecommunications technologies than people in poor and developing countries. Even within a country, people in rural areas do not have as good access to information technology as those living in suburban and urban areas. Those people with inferior quality and less access to information technologies are at a

disadvantage, especially in the area of e-commerce because they cannot reap the economic benefits of e-commerce.

To foster the spread of computer literacy worldwide, the global digital divide needs to be bridged. More, faster, and affordable access with appropriate training to using the information and telecommunications technologies for the people living in villages and poor societies will help them become computer literate and help find better jobs and improve living conditions.

It is not enough to play games and surf the Internet to be computer literate. You do not need to be a good programmer or an expert in computer communications and networking [9], nor do you need a college degree in the computer field to be computer literate. Computer literacy deals with being able to use the computer applications rather than writing software [4]. A computer literate uses the computer technology to perform his job more effectively and efficiently.

In today's information age, it is critical to be computer literate. Unlike the 1950's to 1970's when only the affluent and major corporations could afford computers, they have become a standard household item in the 21st century. The number of personal computers being used worldwide is increasing by the day. Computers are becoming smaller in size, cheaper in price, and more powerful in processing speed with huge primary and secondary storage capacities. Every facet of our lives and every sector of the global society are affected by computers.

2. Data on Computers-In-Use Globally

"The worldwide number of PCs in-use surpassed 820 million in 2004 and is projected to top 1 billion in 2007. PCs in-use growth is slowing as the industrialized world is approaching the top of the S-curve. Strong PC growth will continue in the developing countries for another decade. The U.S. has a large lead with over 220M PCs in-use – over 3X the number in Japan. The U.S. accounts for over 27% of all PCs in-use compared to [its] 4.6% of worldwide population. PC usage is growing rapidly in China, which is expected to surpass Japan in 2007. PC usage is also growing strongly in many populous countries such as Brazil, India and Russia" [Computer Industry Almanac. March 9, 2005 <<http://www.c-i-a.com/pr0305.html>>].

"In 2005 the worldwide number of mobile PCs-in-use are projected to reach nearly 230M units – up from 31M mobile PCs ten years ago. In the next five years this number will more than double to over 480M mobile PCs-in-use by year-end 2010 – a compound annual growth rate of 16%" [Computer Industry Almanac. June 20, 2005 <<http://www.c-i-a.com/pr0605.html>>].

"The worldwide number of Internet users will reach nearly 935 million in 2004 and will top 1 billion in mid 2005. The U.S. continues to lead with over 185M Internet users forecasted for year-end 2004. There is little Internet user growth in the developed countries, but in the next five years many Internet users will be supplementing PC

Internet usage with Smartphone and mobile device Internet usage. Internet usage is growing strongly in China, which surpassed Japan for second place in 2003. The growth of Internet users will continue in the developing countries for another decade" [Computer Industry Almanac. September 3, 2004 <<http://www.c-i-a.com/pr0904.html>>].

3. Benefits of Computer Literacy

People without basic computer skills have difficult time finding a job and stay connected with the local and global society [1]. Employers prefer workers who are computer literate to those who are not. Computer literacy makes a worker more efficient and productive and therefore more valuable to a company.

The young generation growing up with the computer age is more comfortable with using the computer technology than many adults in their fifties and sixties, and especially senior citizens. The latter did not grow up with personal computers and global Internet connectivity. Many adults and senior citizens tend to show initial resistance to start learning the computer applications. Their primary fear is of failure. But once they overcome that fear and learn to use the computer, the feeling changes to that of accomplishment and satisfaction. The application productivity software packages are easy to learn. Most local community colleges offer courses on application software packages and Internet through the continuing education programs at a low cost in the evenings and weekends [9]. Sometimes local churches and temples offer these classes at no cost.

Computer literacy can be very rewarding for people of all ages – children, teenagers, adults, and senior citizens. Some of the benefits are described below.

- (a) The Internet enables us to find a wealth of information on a variety of topics, such as health, cooking, nutrition, entertainment, weather report, road maps and directions, etc.
- (b) The online shops on Internet can be used to purchase items and get them delivered to your house without having to leave the comfort of your house and without having to fight the traffic or bad weather. Today, the utility bills and other bills can be paid online, and banking transactions can be made online which saves time and postage.
- (c) With the spread of global Internet connectivity, email has become very popular way to communicate electronically without having to handwrite or type the document, stuff it in an envelope, seal and stamp it, and then drive to the post office to mail it. This manual process of communication becomes even more cumbersome and costly if you have to mail the same document to multiple people. One can compose and send an email anywhere in the world at any hour of the day or night from the comfort of one's home. "For senior citizens, this is a very easy, inexpensive and satisfying way to keep in touch with children and

grandchildren. Playing games on the computer, surfing the Net, and sending or receiving email alleviates boredom and solitariness.” [5]

- (d) Internet is available 24*7 and can be a great tool to search for a job. The local Chamber of Commerce, local companies, local colleges and universities post job openings on their Web sites. Some of the popular Web sites to search for a job are <www.monster.com>, <www.hotjobs.com>, <www.collegegrad.com> and <www.careers.org> [8].

4. Computer Literacy at Belmont Abbey College

“Attaining technological literacy is as fundamentally important to students as developing knowledge and abilities in the traditional core subject areas. Students need and deserve the opportunity to attain technological literacy through the educational process” [6]. It is the fundamental right of students to be educated in computer literacy to apply technology in their major discipline. Being computer literate will enable students to be productive and help them in decision making.

Belmont Abbey College is a small four-year liberal arts institution located in Belmont, about 10 miles west of Charlotte, North Carolina. It offers Bachelor of Arts and Bachelor of Science degrees in various disciplines. The Southern Association of Colleges and Schools requires that students demonstrate computer competency before graduation. Therefore Belmont Abbey College requires, effective the freshman class of 2003, that each student demonstrate competency in the use of computers for graduation. This competency requirement can be satisfied in one of two ways:

1. Students can take CS 100 – Introduction to Computing course offered every semester by the Department of Computer Studies. Most academic departments either recommend or require their majors to take CS 100 course to become proficient in using the computer hardware, operating system, and applications software to do research and discipline related work. Upon successful completion of the course, 3 academic credits are granted to students.

In the Introduction to Computing course, students learn essential concepts of computing for the first four-weeks. This material is taught using the traditional lecture approach. The topics include history of computers; processing, storage, input, and output hardware; networking concepts, hardware, and software; applications and systems software; Internet, World Wide Web, and email basics; intellectual property rights; computer crime and security; and privacy, ethical, and health issues. The next four-weeks are spent learning Windows XP operating system, Internet Explorer and Email, and Microsoft Word 2002 using hands-on exercises. In the last four-weeks, student learn Microsoft Excel 2002 and PowerPoint 2002 using hands-on exercises.

The Department of Computer Studies determined the following objectives that students should satisfy after completion of CS 100 course:

1. Describe and discuss the importance of data as a business asset.
2. Identify the basic parts and functions of information systems.
3. Identify the devices that comprise a computer system and describe the functions of each.
4. Describe the role and function of system software.
5. Identify and discuss some of the issues faced by the CIS (Computer Information Systems) profession and society at large, including the topics of security, privacy of data, and intellectual property rights.
6. Identify and be able to discuss the effects computers are having on individuals, businesses, schools, homes, and governmental agencies, including databases and data communications.
7. Use a microcomputer system and its operating system.
8. Enter text into, revise text in, and print text using a word processor.
9. Use a spreadsheet to construct simple models using formulas, to dynamically revise the model, and to print the spreadsheet data.
10. Prepare a simple computer presentation.
11. Access remote computers to send and receive information.

Students are required to complete total of five assignments on the topics of computing concepts, Internet Explorer, Microsoft Word, MS-Excel, and MS-PowerPoint. They take three exams, and every student individually writes a four-page research paper.

In the most recent Student Opinion Survey done in spring 2005 for CS 100 course at Belmont Abbey College, 41% students strongly agreed, 47% agreed, and 12% were indifferent to the question *I found that the goals, purposes, and outcomes that were set out in the syllabus were achieved.*

2. Students also have the option to take and pass the computer competency test. Students do not receive any academic credit for passing the test.

The first version of the test was prepared and administered by the faculty of the Department of Computer Studies. The test was two-hour long and consisted of the following four parts:

Part 1: A written part focusing on how computers work, their effects on society and job opportunities, and ethical issues in the use of computers.

Part 2: A hands-on part testing students' computer operation skills, especially:

- Starting up and shutting down computer systems and peripherals.

- Formatting and using diskettes, including copying files between diskettes and hard drives.
- Creating, naming, and renaming directories (folders) and subdirectories (subfolders).

Part 3: A hands-on part testing students' word processing skills, especially:

- Text entry and editing.
- Copying and moving blocks of text.
- Spell checking.
- Specifying and changing text format and page set-up (margins, fonts, tabs, etc.).
- Headers, footers, and page numbering.
- Inserting graphics into documents.

Part 4: A hands-on part testing students' telecommunications skills, especially:

- Connecting to the Internet and using search engines.
- Using electronic mail (compose, send, receive, and respond).
- Attaching files to e-mail.
- Sending and receiving files using the Internet.

In addition to these college wide competency requirements, individual departments could require additional skills of their majors, for example, skill in the use of database, spreadsheet, graphics, statistics, or presentation software.

Students could take the test at prescheduled dates anytime before graduation. Although the Department of Computer Studies emphasized to students the importance of passing the test early in their academic career because many courses assumed that students would have the knowledge of using computers to do the course-related work. A 60% score was required to pass each of the four components of the test. Students who failed a part of the test could retake only that part at a later date. Once a student passed all the four components, he would satisfy the competency requirement. Students who failed the test and did not want to retake it, had the option to take a computing course approved by their major department.

The Computer Information Systems majors were neither required to take the competency test nor to take CS 100 course to satisfy the competency requirement. The Education department required all their Elementary Education majors to take ED 300 – Technology and Learning course (3 credit hours) and to submit a portfolio to satisfy the competency requirement. The departments of Business and Accounting required their majors to take BU 221 – Spreadsheet Applications course (3 credit hours) to satisfy the computer competency requirement.

The first version of the competency exam did not test students' knowledge of spreadsheet and PowerPoint software. In spring 2005, the Computer Competency Subcommittee of the college, composed of a total of five members from faculty, library, and the department of institutional research, designed the second version of the test that was given to all incoming freshman in small groups during the fall 2005 semester. The test is 30-minutes long and is made up of a total of 63 true/false, multiple-choice, and fill-in-the-blanks questions. It is completely written test with no hands-on component in it. It tests students' general computer knowledge, and Internet, word processing, PowerPoint and spreadsheet skills. The passing criterion is 60% score on the test. Those who pass the test will satisfy the computer competency requirement but will not receive any academic credit. Those who fail the test can either retake the test at a later date, or take CS 100 course, or take a computer course designated by their major department.

5. Future Plans

The Computer Competency Subcommittee plans to automate the test by administering it online, grade it online and give immediate feedback to students.

6. Acknowledgements

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Computing Curricula

Overview Report

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