Advantages of Computer Based Educational Technologies for Adult Learners

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Abstract

This paper focuses on the adult education and adult learning characteristics, advantages of educational technology for adult learners; explains the using of computer based educational technologies such as ;Computer Assisted Instruction (CAI) ,computer assisted interactive learning and Computer-Mediated Communication (CMC) in adult education; examines the advantages and suitability of these methods from the point of the adult learning characteristics.

Key Words: *Adult Learning Characteristics; Computer Assisted Education; Computer Mediated Communication; Interactive Learning*

Introduction

There are minor differences of opinion as to what adult education is and what it should do. The term adult education can be used in three different meanings: (1) a field of operations that encompasses all the organized activities in which mature men and women engage for the purpose of learning, usually under the auspices of an institution; (2) a process of self-directed inquiry through which individuals systematically learn from their daily experiences and other resources in their environment; and (3) a social movement that encompasses the whole spectrum of mature individuals learning in infinite ways under innumerable auspices the many things that make life richer and more civilized and is dedicated to the improvement of the process of adult learning, the extension of opportunities for adults to learn.

Because of our study's subject is «advantages of computer assisted instruction and computer-mediated communication in adult education», in this study, we accept the second meaning of adult education above mentioned.

What we know about the typical adult learner is that he/she is well-educated, white, and middle-class. Also, as with traditional learning settings, the most successful distance students are those who most educators would term "good students". By combining all of these factors, we find that distance education is providing increased access, quite often, to the same people who have always had relatively good access to educational opportunities. In other words, we are increasing access, but not necessarily broadening it.

Technologies offer considerable promise for meeting the needs of adult learners, because they can deliver learning in places other than classrooms, facilitate the efficient use of precious learning time, sustain the motivation of adult learners, and reach many different types of learners in the ways they learn best. Technology has the potential to eliminate some barriers to participation and address some of the unique needs of adult learners.

Computer based educational technologies and methods such as computers and computer assisted instruction and computer-mediated communication offer the potential to affect service to especially adult learners. In this study we want to find an answer the following issues: How much do these technologies and methods improve access to adult education? What are the advantages of these? Are they appropriate for all adult learners? Are they better than traditional approaches?

Adult Learning Characteristics and Advantages of Educational Technologies for Adult Learners

Cross (1981) presented the "Characteristics of Adult as Learners (CAL) Model" in the context of her analysis of lifelong learning programs. The model attempted to integrate other theoretical frameworks for adult learning such as andragogy, experiential learning and lifespan psychology.

Knowles (1984) has defined andragogy, a theory widely used in the adult learning literature. The term is based on the psychological definition of adult, which states that people become adults psychologically when they arrive at a self-concept of being responsible for their own lives, of being self-directing.

Andragogy is based on six fundamental assumptions about the unique characteristics of adult learners:

1. The learner's self-concept. Once adults have arrived at the stage where they take responsibility for their own lives, they develop a deep psychological need to be seen and treated by others as being capable of self-direction.

2. The role of the learner's experience. Adults enter a learning experience with both a greater volume and wider diversity of experience over children.

3. Readiness to learn. Adults are ready to learn what they need to know and be able to do in order to cope effectively with their real-life contexts.

4. Orientation to learning. Adults are problem-centered, or life-centered, in their learning orientation. They are motivated to learn to the extent that learning will help them perform tasks or deal with real-life problems.

5. Need to know. Adults need to know why they should learn something before devoting the energy to it.

6. Motivation. The best motivators are internal, such as self-esteem, quality of life, or increased job satisfaction.

Ference & Vockell (1994) gave a list of adult characteristics. These characteristics were the following: 1) Active-learner, 2) Experienced-based, 3) Experts, 4) Independent, 5)Hands-on, 6)Life-centered, 7)Task-centered, 8) Solution-driven, 9) Value-driven, 10) Skill-seeking, 11) Self-directing, 12)Motivation (External), 13) Motivation (Internal).

A short list of characteristics of the typical American distance learner (Moore & Kearsley, 1996) looks like this:
- Most are adults aged 25-50.
- Distance learners take courses for many reasons, particularly to learn new subjects and skills or update old ones. They may enroll to fulfill a personal goal or for work-related reasons.
- Most participate in a DE course voluntarily.
- Most are not strangers to formal education.
- The more experience the learner has with formal education, the better his/her chances are of completing a distance learning course.
- Distance learners tend to be more field independent and self-directed than traditional learners.
- Most take learning seriously, are highly motivated, committed, and task-oriented students who want to use the knowledge they have gained.
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Technology offers a promising resource (via computer networks, distance learning systems, software, and video materials) for training staff and volunteers, sharing information about promising practices, and reducing the isolation of many programs. The new technologies offer ways of individualizing instruction to meet the needs of types of learners and can offer opportunities to individualize instructions, reaching all types of learners in ways they learn best.

So, is there value added by using technology in adult education? As with so many other innovations, the value is not intrinsic, but rather depends on how and for what purposes one uses the innovation. Simply adding technology without challenging ourselves to do things we could not do before, or to do them differently, is meaningless at best, and very expensive at worst. On the other hand, technology applications and activities that lead to expanded opportunities for learning can only help adult learners acquire the skills and mastery of tools to support independent, lifelong learning.

The advantages of technology for adult learners are the following:
1- Reaching learners outside of classrooms
2- Using learning time efficiently
3- Sustaining motivation
4- Individualizing instruction
5- Providing access to information tools.
6-

Thus the successful integration of these technology products and others into adult education depends upon the following five implementation points:
1) Planning: Educational technologies encompass a family of interrelated hardware, software, and knowledge. This suggests the need for a blueprint or plan for using technology. Planning is a must for implementing technology in adult education.
2) Training: The adoption and implementation of technology is not simple. Because of this complexity; there is a high need for users to acquire new skills and knowledge for using the technology. This

implies that training needs to be part of any technology implementation process. Technology training is a requirement if adult educators and adult learners are to maximize the potential of educational technology:

3) Technical Support: Technology is not self maintaining. It does not always work the way it is supposed to. Adult educators and adult learners require technical support, to both maintain the technology, and to maximize its inherent advantages over other less sophisticated educational tools.

4) Leadership: Most successful technology implementation processes need champions who will guide others. Although leadership should come from organizational leaders, many adult educators can also be champions and provide informal leadership.

5) Resources: Educational technologies cost money. They require time for implementing and they- will not be self-supporting. This implies that adult education organizations need to rethink hour they allocate resources and spend their time.

The common characteristics of educational technology are the following:

- Human learning is an objective: educational technology is fundamentally preoccupied with learning-related problems and uses a systematic and a systemic approach to solve them.
- Systematic approach (pedagogical design): a systematic approach is a logical and gradual sequence of operations or activities. It is exemplified in the organizational and operational methods of educational technology.
- Systems method: the relationship between the systems approach, as a science and a source of general systems theory, and educational technology has been well established. It supplies a global conceptual framework for educational technology which is both systematic in its procedures and systemic in its approach to problem-solving.
- Use of media: educational technology's basic focus is on educational resources and the use of media in education.

Computers and Computer Based Educational Technologies in Adult Education

In this part of this study ,we review the computer based educational technologies such as computer assisted instruction , computer assisted interactive learning,and computer mediated communication from the point of the characteristics of adult learning;

The computer's capacity to allow learners choices over content as well as provide immediate feedback on the learner's responses makes it particularly well-suited to maintaining the motivation of a student as he or she progresses. These features are particularly important for adult learners who often feel that learning is difficult and may need to re-experience themselves as successful learners.

Computers give students a sense of empowerment and control. Students can control the pace and repeat lessons when they feel the need to do so; thus, they can progress at a learner defined pace and move ahead when they feel that they are ready. More important, the computer's capacity to interact with the student changes the instructional process. Traditionally, it is the teacher who controls the interaction.

Working with computers also helps to bring adult students into the technology age. Often, the environment of low-income adults, older adults, and illiterate and functionally illiterate adults does not afford experiential access to technology (Edwards, 1993; Tousignant, 1996).

As well as enabling students to achieve at higher levels, researchers have also found that CAI enhances learning rate. Student learning rate is faster with CAI than with conventional instruction. If students receiving CAI learn better and faster than students receiving conventional instructions alone, do they also retain their learning better? The answer, according to researchers who have conducted comparative studies of learning retention, is yes. Most of the research that examines the effects of CAI and other microcomputer applications on student learning outcomes also investigates effects upon student attitudes (Cotton, 2002).

Patience is a virtue that the computer offers. During instruction, students' responses are not timed (unless the program has a timer that the teacher can set); hence, students can move at their own pace (Finnegan & Sinatra, 1991). Utilizing CAI also allows students to receive instant feedback, which is beneficial for the adult student because it reinforces successful instructional behaviors.

Many software programs also enable instructors to individualize instruction. Individualization is essential in adult education because more often than not, adult education classrooms are filled with students working on a range of educational levels with a diverse of personal backgrounds and educational experiences.

Moreover, not only do these patrons bring a wealth of personal experience but also their reasons for attending adult education programs vary (Askov & Bixler, 1996).

Computer-assisted instruction (CAl) delivered on a personal computer has been viewed optimistically by many researchers since its introduction in the 1970s, it has been claimed that if judged by a number of criteria that include achievement gains most CAI uses one or a combination of the following techniques:

- tutorial,
- drill and practice,
- learning games,
- simulation,
- problem solving,
- assessment, and
- demonstration/presentation.

The most common of all techniques is the tutorial. It is used to introduce new information when objectives must be taught in a sequential manner. Another commonly used technique is known as drill and practice. It provides opportunities for practice when mastery of a new skill or information is desired. It should be used after initial instruction. Learning games supplement other instruction and are used to provide motivating and engaging opportunities for practice after a skill or new information is taught. The technique of simulation is most often used when practicing a skill in its real context is too costly or dangerous to undertake. It provides an opportunity for experimentation, and builds realism and relevance into the learning situation. One of the most challenging techniques used in CAI is problem solving. It helps students develop skills in logic, solving problems, and following directions, and is generally used to augment higher order thinking skills. Assessment is a valid part of any learning experience. Computer-based assessment can be used to initially place and then monitor students' progress within a curriculum. Demonstration or presentation is best used to support the introduction of new information. It can also be used as a review tool.

Computer-assisted instruction (CAI) is utilized because of the benefits it offers to adult learners. Not only does CAI assist students in developing skills in logic, problem solving, and following directions, it also aids in improving academic proficiency in areas such as reading and vocabulary, language, writing, and listening (Askov & Bixler, 1996; Tousignant, 1996). These benefits stem from an array of diverse, innovative software programs. Although some of the programs available offer a drill-and-practice format, (e.g. The Spelling Voice, Zpellar, and A+), other software programs offer word processing which integrates reading with writing, or text adventures (i.e., story, game or simulation), or branching where students move to different levels without the teacher having to check their work before they continue (e.g., Educational Publishing Concepts Reading Series, Grammar Games, and Tackle English). Some programs even offer holistic literacy interactions in which students "become engaged with scripts and use language to discuss, plan, and solve problems" (Finnegan & Sinatra, 1991, 109). Most adult students like CAI because learning remains challenging yet fun (Tousignant, 1996).

CAI also has several attributes useful to adult students; it offers privacy, patience, feedback, individualization, and control. Most adult learners do not want others to know about their academic deficiencies. They also take errors more personally and allow mistakes to effect their self-esteem. CAI not only provides privacy, the computer is nonjudgmental and allows low-level ability students to work on improving their skills without divulging their ability level to classmates (Edwards, 1993).

When taken as a whole, conclusions drawn from the studies that compare the effectiveness of CAI to traditional methods comprise an incomplete consensus. If there is a common thread to these examples, it is that they underline the need for methodological revisions in the design of studies comparing these two learning approaches. Specifically, more control is needed to address the differences in participants prior to an educational endeavor by assigning them on a random basis, equalizing treatment times, and equalizing the size of the treatment and control groups. By taking measures to adjust and refine the weak points in experimental design of previous CAI studies, the results from future research can achieve better generalizability and ultimately a clearer assessment of the efficacy of computer use in adult education programs.

The key advantage to CAI in any educational setting is reported to be the individualized nature of the method of delivery. As a result, the presumption is that individualized instruction is being facilitated in modem prisons with the use of CAI (Batchhelder, 2000).

With the declining cost and continued convergence of computing and communication technologies, and the availability of networked, computer multimedia communication, instruction supported by Web and e-mail interactive technology has been widely adapted by teaching and learning institutions.

Computer multimedia and networking is regarded as an ideal supporting technology to meet the increasing, the demands for continuing adult education. But according to the some opinions in literature (Liang & Mcqueen, 1999) this technology may or may not suit the learners' characteristics and their prior learning style.

Yi and Majima (1993) asserted that distance learning provided a low-anxiety learning environment and a relaxed atmosphere that lowered the learner's affective filter. Similarly, in a study (Liang & Mcqueen, 1999) it was founded that the e-mail interactive learning style was more suitable for the introverts than face-to-face learning style, because introverts may feel more comfortable in expressing themselves in e-mail interactive learning.

Yet, technology can radically change the-nature of traditional distance education with its potential for enhancing communication, community and collaboration. Traditional distance education was a solitary endeavor; each learner worked alone and drew upon course materials and limited communications with the instructor as the sources of information, ideas, and feedback. But interactive distance education is a process of providing an alternative approach for individuals to pursue educational and employment related objectives that can meet both their immediate and long-term needs. This form of distance education also fits many needs of adult students who have become a significant part of the enrollment on college campuses worldwide. In this form of distance education the teacher and students, although physically separated, can see and hear each other through two-way audio and video communications thus providing a real-time teaching/learning environment. Interactive distance education is usually provided utilizing a compressed by cable or TI lines (Carter, 1996; Cochenour & Rezabek 1995).

Liang and Mcqueen (1999), found that e-mail interactive learning was more effective for peer-oriented learners. They pointed out that Web-based interactive learning may help in keeping the various types of learners together. When there are big differences among learning peers, the instructors or educators should not only familiarise themselves with, but also become more understanding of these differences in order to deliver better learning opportunities. The more we understand those influences, the more successful we can make multicultural computer assisted adult interactive learning.

The benefits of online learning using computer mediated communication are the following: (a) convenience due to minimal disruption of family and work life; (b) elimination of space, time and geographical constraints; (c) increased peer interaction due to a collaborative rather than competitive learning environment; (d) increased interaction with more accessible teachers with decreased feedback turn-around time; (e) increased quality of learning with deeper critical reflection and systematic scaffolding of ideas taking place; and (f) increased access to databases and other resources not normally available distance learners (Berge, 1995b; Hiltz, 1994).

The challenges of CMC have also been well documented and include: (a) technical frustration due to the total reliance on technology and outside support systems: (b) increased time-on-task due to the slowness of the medium and the higher volume of messages, which also contributes to feelings of information overload; (c) frequency of miscommunication due to the loss of visual cues; and (d) disjointed flow of communication because of the asynchronous time frame (Hiltz, 1994; Wiesenberg & Hutton, 1996).

From the extensive analysis of the literature on designing CMC instruction, Berge (1995a) concludes that students and teachers need to dramatically change the roles each plays in the learning-teaching process when moving from a face-to-face to a virtual classroom. Berge offers an instructional framework that categorizes teaching in a virtual classroom as a moderating function that has four essential components. They are: (a) pedagogical (didactic and guidance oriented, this role shapes on-line discussions to focus on critical concepts); (b) social (supportive and consultative, this role creates a friendly, inclusive and collaborative learning environment); (c) managerial (administrative and organizational, this role sets the agenda, learning objectives, procedural rules and norms); and (d) technical (technically skilled troubleshooter, this role makes the technology invisible to the users).

Discussion
Although there are minor differences of opinion as to what adult education is and what it should do, we accept it as a process of self-directed inquiry through which individuals systematically learn from their daily experiences and other resources such as the technologies and educational technologies in their environment. According to the finding of some researches, "self-directing" is one of the most important characteristics of adults and individualization is essential in adult education. The new technologies offer ways of individualizing

instruction to meet the needs of types of learners and they can offer opportunities to individualize instructions, reaching all types of learners in ways they learn best. On the other hand, technology applications and activities may support independent and lifelong learning of adults.

The ability of the computer to allow students to control the learning experience may be the greatest strength of CAI. CAI may be adults' only opportunity for exposure to computer and it can meet the needs of the adult learners with a relative degree of success. Adult educations can promote and encourage CAI by integrating it with traditional teaching as often as possible. They should not forget that e-mail interactive learning and teaching is more suitable for the introverts (adults) than face-to-face learning styles.

New educational technologies offer the potential to effect service to all learners, but especially adult learners. Because of this fact, adult educators have become enamored by the possibilities offered though the Internet, distance education, and computers in general. Recently, adult learning covered this topic several times. Key research trends deal with the fallowing issues: how much to the new technologies improve access to adult education? Are they as good, in terms of learning outcomes, as more traditional approaches? Are they better then traditional approaches? Are they appropriate for certain groups and not others? If so, what are the parameters of these differences? Are some groups excluded by the heightened emphasis on learning via distance and/or bye computer? What are the policy implications of these findings?

As instructors, we must recognize that what adult learning characteristics are and why they don't participate in learning activities, in order to bring about effective and interactive instruction and to help insure that learning takes places. Here, the question is are adult educators ready and able to articulate what the potential of new technologies is for their learners. Adult educators must know that without adult education looking at the fire points for implementation seriously, and addressing each one collectively; the potential of educational technology in adult education will not reach rising expectations.

Conclusion

Adult education is a process of self-directed inquiry through which individuals systematically learn from their daily experiences and other resources and educational technologies in their environment. Technologies offer ways of individualizing instruction to meet the needs of adult learners and can offer opportunities to individualize instruction; reaching all adult learners in ways they learn best. The unlimited benefits and advantages of technologies are the following:

1. Reaching learners outside of classrooms.
2. Using learning time efficiently.
3. Sustaining motivation.
4. Individualizing instruction.
5. Providing access to information tools.

New educational technologies and methods such as computers and computer assisted instruction and computer-mediated communication offer the potential to affect service to especially adult learners.

According to the some opinions in literature, computers and computer-assisted instruction is utilized because of the many benefits they offer to adult learners. But, although the computer multimedia and network, is regarded as an ideal supporting technology to meet the increasing, the demands for continuing adult education, according to the same opinions in literature this technology may or may not suit the learners' characteristics and their prior learning style.

Yet, technology can radically change the nature of traditional distance education with its potential for enhancing communication, community and collaboration. Interactive distance education is a process of providing an alternative approach for individuals to pursue educational and employment related objectives that can meet both their immediate and long-term needs and also fits many needs of adult learners.

According to the some opinions in the literature computer mediated communication and learning is utilized because of the many benefits offer to adult learners. But when moving from face to face to a virtual classroom, adult learners and instructors need to dramatically change the rules each plays in the learning-teaching process.

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