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Adult Learners and Technology:

How to Deliver Effective Instruction and Overcome Barriers to Learning

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Abstract

The proliferation of technology and online learning has created a wealth of learning opportunities for educational institutions, businesses and adult learners. As more and more adult learners seek to gain knowledge through formal and informal training delivered through self-paced distance learning, barriers to successful learning continue to crop up and have to be dealt with by instructional designers. Because computer-based learning involves learning both a the system of content delivery and the content itself, many adult learners are stymied and frustrated by the learning system due to a lack of prior experience with technology and assistance from course instructors. This paper outlines the factors that cause "technophobia" or computer anxiety in adult learners, and suggests several methods of coping with that anxiety so that it does not cripple the adult learner. Preparing them to utilize the technology involved in a non-threatening context that will allow them to succeed is critical to foster positive attitudes in adults towards technology and learning.

Adults and Technology: How to Address Issues and Fears of Adult Learners in Technology Training and Education

Society today is becoming increasingly dependent on all forms of technology for daily functioning. The number of telephone area codes is exploding as the use of wireless phone communications more than doubles the demand for telephone numbers. Car manufacturers are designing short-range wireless network systems that would allow impact and brake sensors to transmit that information to cars in the immediate area, alerting the driver to potential traffic jams and other problems ahead. Cities are putting up free wireless zones for access to the internet, and just about every coffee shop or airport these days has free wireless computer access. You can even make telephone calls overseas via computer for a fraction of the cost of using a traditional telephone. There is little doubt that technology hardware is advancing at a mercurial pace, but are the users of technology able to keep up?

Designers need to understand the needs of adult learners, their motivations, expectations, and experience level. Creating information that taps into the strengths of an adults' experience and ensuring that clearly defined goals and expectations are laid out beforehand will help ensure higher participation and follow through in online courses. Adult learners enjoy taking on the responsibility for their own learning, and when properly guided and prepared for a learning experience they are quite capable of achieving a high level of competency. Instructional designers are looking more and more into how to best create formal and informal learning opportunities for adult learners so that they can gain the skills necessary to become lifelong learners.

In the late 1990s, there was a lot of discussion about the so-called "digital divide" between those that had access to technology, and those that did not. While more affluent people still have greater access, technology has become cheaper and more accessible to everyone (Day, Janus, & Davis, 2005). More and more families own a computer that has access to the internet. Over 62% of U.S. households own a computer, and 55% of U.S. households have home access to the internet (Day et al., 2005). Mere access to technology however does not make one able to use it. As the rise of the internet has brought a tremendous surge in the availability of information, pressure on adults to learn and adapt to new technology for work and pleasure has increased. The popularity of distance-learning and computer-based training for both formal and informal learning has made it more and more important that adults be comfortable with using computers to learn for both work and personal enrichment. However, many adult learners have anxiety, resistance and poor attitudes about computers, which can make even the best computer-based instruction fail if the needs of these learners are not identified and addressed.

This paper addresses two key aspects of adult learning in an attempt to outline a general strategy for training adults in technology use and technology-based learning. First, what are the barriers to learning that are most commonly found in adults, and how can they be identified and addressed so that the adult learner can still be successful. Second, a review of computer-based distance learning compared to traditional face-to-face learning, and some of the critical elements for making that experience successful in adults.

Barriers to Technology Learning in Adults

With the rapid advancement of knowledge and information in today's society, we have converted from a manufacturing-based economy to an information-based economy. This has

presented new challenges to most adults, as they are faced with having to constantly keep up with the changes around them. Today more then ever, adult learners need to update their knowledge for skills improvement, job advancement, and personal growth and understanding (Lawson, 2005). Career changes and job changes are commonplace, which means today's adult must be able to acquire and assimilate new information to be able to survive. Adult learners have several important characteristics that need to be considered. First, they need to feel that whatever they learn is important and relevant to their lives. Second, adults like to be self-directed and responsible for their own learning, which is why distance learning is such an appealing option for knowledge dissemination. Third, the life experiences of adult learners form the foundation of their learning environment. Fourth, adult learners are goal oriented and want the learning to be clearly defined with achievable goals. Fifth and finally, adult learners are more motivated to learn information directly related to their job or social life (Rutherford, 2004). Any training or education program must understand these characteristics of adult learners to ensure the program is structured around their needs.

Traditionally, knowledge and training was provided in one of two ways: on-the-job training supplied by your employer or personal learning by attending courses at a college or university. However, both businesses and educational institutions are turning towards using technology-based distance learning to make information and content available to adult learners on their own schedules and pace. "It has become apparent that computer competency is necessary not only for citizens to function efficiently on a personal level in our society, but to develop, advance and succeed in their professional lives." (Orr, Allen, Poindexter, & Canning, 2001, p.26) However, this also presents a problem, as computer-based learning presents several impediments to most adults today.

"Technophobia" or "computerphobia" are phrases used by researchers to describe a condition in which a learner has "(a) resistance to talking about computers or even thinking about computers, (b) fear or anxiety towards computers, and (c) hostile or aggressive thoughts about computers" (Jay, 1981, p.47). Most people believe this is a condition that afflicts primarily those people who were born before the advent of computers, namely older people. However, the research paints a very different picture. One study supported by Dell Computer found that 55% of Americans identify with one or more of the 3 components of technophobia (Williams, 1994). Other studies including some meta analyses have concluded that 25% to 33% of all people are afflicted with technophobia (Rosen & Maquire, 1990). That includes college students, businesspeople, teachers, and the general public. One might assume that because these references are a bit dated that the boom in technology use in the last 10 years has reduced this anxiety in our adult population. Again, contrary to common believe, computer anxiety is not a temporary problem that will simply disappear once the current generation of young people who have grown up with increased computer exposure reach adult hood. In fact, Torkzadeh and Angulo (1992) suggest exactly the opposite: increased demands for computer competency and literacy in the future will far outpace currently training in high schools and colleges, leading to even greater computer anxiety, not less.

Anxiety is a major impediment to technology use and implementation, and a major barrier to adult computer-based learning and training. In order to better meet the needs of the learners, educators and trainers need to have a good understanding of the factors that affect a learner's computer attitude, and thus be able to identify high-risk learners that may need extra intervention. The main influences on computer attitude and anxiety are (a) previous computer experience (b) education-level (c) age (Orr et al., 2001). In their study, the examined what

factors affected a positive change in attitude along several demographic dimensions. The findings are informative and important for helping adult learners reach their full potential. In summary: (1) computer anxiety can be reduced through formal computer instruction, especially courses greater than 30-hours in length; (2) positive computer attitudes are more likely to be reported if a person has some practical experience using a computer; (3) age was not a factor that affected computer attitudes, and older students were often found to be more motivated to work with computers and reported less anxiety at the end of training (but reported more anxiety than their young counterparts at the beginning); (4) interest level was the strongest predictor of computer attitude, with more confidence and less anxiety reported for the more interested students.

These findings present a dilemma for educators and trainers of adults in technology. Many adults do not have the time to dedicate to a 30 hour training course, and thus may be unprepared for the demands of computer-based training. In fact, today's teachers leaving teacher training programs today, are often uncomfortable with technology, unable to effectively integrate it into their teaching, and thus not providing students with the positive experience and exposure they desperately need (Kotrlik & Redmann, 2005). Meanwhile, we move to more and more computer-based training models. While it is not practical to send every employee or student to a 30 hour training course on using technology, it does suggest that any company or educational institution wishing to make good use of computer-based educational programs needs to seriously look at providing some form of basic computer skills training to its adult learners. While many may be skilled or experienced enough to go directly to the computer-based training, there must be a way to prepare those who are not to use the technology before they actually receive training. In effect, trainers and educators are dealing with two separate

issues: how to use the content delivery tool, and how to deliver the content. It is as though you had to teach everyone how to take notes before you start a presentation, because they do not know how to do it. Not being able to take notes clearly would have a deleterious effect on learning since people could not absorb or remember the materials presented.

Computer-Based Learning and Adults

The good news in this is that adults, when highly motivated, expressed more positive computer attitudes, feelings of competency and satisfaction than younger learners (Orr et al., 2001). The quality of learning between traditional courses and online courses is equivalent, assuming the student completes the course (Canning, 2002). Designing instruction around information that adults perceive as relevant and important greatly enhances the chances for success in adult learners. Online learning also removes many of the traditional barriers to learning and makes it easier to distribute information (Gorard, Selwyn, & Madden, 2003). Situational, cultural, and personal constraints can often be relieved through non-traditional, online learning. However, just designing training or learning opportunities, both formal and informal, is not enough. Researchers have shown that several factors can influence the success of any technology-based learning opportunity (Yorks, 2005; Selwyn & Gorard, 2004; Lawson, 2005; Gorard et al., 2003).

First and foremost, designers need to take into account why the adults are undergoing the training provided. Adults receive training in new skills and education for a number of reasons: Professional training to stay current in their job field. Others may need to acquire the skills to evaluate the information that is so readily available on the internet without any authentication. Many adults may simply be motivated as a lifelong learner that wants to communicate with friends and family that live in another state or country. Regardless of the

circumstance all "have a need to learn that is grounded in their daily lives" (Lawson, 2005). It is critical that the training they receive not only be rich in personal and practical applications.

Drawing on the rich diversity and eclectic backgrounds of the adult learners is a fundamentally sound method of reinforcing the course material. While it is not always possible to redesign a course for each new set of students, knowing the audience ahead of time and providing rich opportunities for integration of knowledge from experience and the classroom is essential to engaging adult learners (Lawson, 2005). "An instruction program integrated with evocative digital resources provides the opportunity for instructors [or facilitators] to reduce anxiety and to help their students make connections and form relationships across the boundaries of classroom, discipline, skill, and background" (Lawson, 2005).

Participation in computer-based programs, while popular, often leads to several frustrations. Students in online learning often have a much higher drop out rate compared to their peers taking a course in a traditional setting. While standard training programs had a completion rate of 65%-73%, online versions of the same program had only a 33% completion rate (Canning, 2002). Roughly 75% of the participants (*n*=32) listed the following reasons for dropping out: (1) Pressure at work: 25% (2) Lack of support and guidance from instructor: 22% (3) Too time-consuming: 12% and (4) Technology difficult to use: 12% (Canning, 2002). Personalized support at the front end of the training and attempting to identify those students who may need more extensive intervention and computer technology assistance to ensure they will be able to make effective use of their time without losing valuable time struggling with technology issues and not the actual coursework. This includes troubleshooting or establishing the use of newer technologies such as video conferencing that require several pieces of hardware, high-speed data access, and special software. "The more distant the learning, the

greater demand there was for a more personalized tutorial service" (Canning, 2002). All of these technological road blocks must be cleared before the adult learner can truly become engaged and excited about learning.

While formal, structured learning courses are still a major focus for education and businesses, the explosion of the World Wide Web has made opportunities for informal learning, especially procedural or "how-to" knowledge. Informal learning is highly personalized, and requires the technological skills and training mentioned in the first part of this paper. While having the technical skills to use the computer and navigate the web is important, informal learning both for personal and business goals is becoming more and more computer based. Vast amounts of information are being stored and cataloged in interest groups on just about any topic one can think of. Armed with a few technology tools (or toys depending on your view) information that was previously held in the minds of a few experts is now being cataloged, warehoused and distributed through personal interest websites. Some research has started to investigate how these informal learning spaces are created and utilized by adult learners (Selwyn & Gorard, 2004). Their findings show that once adult learners are comfortable with the technology use, namely the hardware and the ability to search and filter through information on the internet effectively, informal learning can explode. If you want to know how to paint your motorcycle or select the best detergent for your new front-loading washing machine, you can find it. While the researchers were encouraged to find more widespread of informal learning opportunities, they also found that computer-based learning was detrimental to some learners as they become too reliant on a single tool for information gathering. The computer tended to become the only conduit of information gather for some individuals, even when it was not viewed as the best tool to gather the required information.

Despite this, informal learning opportunities are continuing to grow with the proliferation of the computer and internet access into more and more households.

In summary, technology is becoming an increasingly popular tool to provide the content for life-long learning since internet-based training has made the classroom available 24 hours a day, seven days a week. Research has shown that adult learners, when properly trained on how to use the technology are highly motivated learners that are capable of absorbing both the content and technological skills necessary to succeed. Designers creating formalized learning opportunities that are computer-based are advised to ensure that the content is directly applicable to the lives of the adult learner, as they have a low tolerance for learning without a purpose. To ensure higher success rates in distance learning settings, expert advice and feedback to handle technical issues surrounding the content delivery system is required to help adult learners become comfortable with the system. If adult learners perceive a lack of support or find themselves spending too much time completing a program they feel could be done in a traditional manner more rapidly, they are likely to drop out of the learning module. Finally, making the skills training in technology available and useful to adult learners helps ensure they will take advantage of the multitude of formal and informal learning opportunities available on the World Wide Web. Once adult learners have gained confidence in their ability to use the technology efficiently, they are far more likely to report positive attitudes towards using technology and distance learning as a means of self-improvement. In our information-based 21st century, this method of information gather and life-long learning will become more and more important to stay competitive at work and provide enrichment for personal gain.

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