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Infusion of ICT into Adult Education in Turkey

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Abstract

This paper investigates the role of information and communication technology (ICT) in facilitating and supporting informal learning in adults. Although the potential of ICT for stimulating formal learning has been widely discussed, the area of adult education remains under-researched. This paper reports how adult educators are using ICT. Based on data from a survey of 276 respondents we maintain the range of adult educators' ICT skills and how ICT both facilitates and suppresses their teaching environment. The findings show that there is an increasing demand for a variety of learning opportunities for adult educators. Adult educators are very willing to use ICT and by this way they expect to improve educational outcomes and to increase participation in all forms of adult education Adult educators welcome ICT widely as having the potential to increase access to learning. However, they pay special attention to the infrastructure, support services, cost, time or space as main barriers.

Keywords: information and communication technology, adult educators

Introduction

It is commonly accepted that technology affects all aspects of modern society. Especially in the last decades, technology is widely used in all parts of social, economic and educational life. The notion that technology may be 'beyond' the formal limits of schooling is one that is gaining momentum all over the world. Technology has been vital part of all of the learning activities and daily routines. Unlike the prejudgment that implies younger people use technology widely, adult at every age face to use technology in the every phase of their life such as banking, shopping and social interaction which affect the adult educations scope. Therefore technology usage gained vital importance among adult employees in vocational and adult education as well (p. xv). Thus the adult educators need technological skills more for enhancing the learning experience. Regarding the variety of technological applications used in adulthood, technology literacy and ICT skills of adult educators is getting a dispensable factor for educators to understand how one may utilize technology to foster a change in behavior with appropriate teaching methods and instructional technologies for adult educators. The emergence of new technological developments, coupled with the need for life-long education both after school and work life, raises the issue of the types of ICT skills and knowledge necessary for adult educators to deliver effective and professional courses for adult learners intending to follow new developments in their life (Wang , 2013). Moreover, Castells (2002) urges that ICT requires new organizational forms for its usage. Current use of ICT in education is requiring everyone to closely follow developments in this area. Both formal and non-formal educators are faced with having to learn and adopt the basics of ICT into their teaching. Adult education aims to create a culture in which people regard knowledge and skills acquisition as a continuous part of everyday life. Whereas adults used to employ traditional learning tools and materials in libraries, now such things are readily accessible via the Internet and through the educational outreach programs of major

institutions, thus leading to two broad categories of education. Adult educators teach a variety of subjects in places such as adult education centers, adult high schools, university extension programs, and even prisons. Some adult educators teach "distance-learning" classes. Instead of meeting face-to-face, they engage in long-distance communication with their students, often via the Internet. Learning cannot, therefore, be confined to traditional settings, such as a school or university, and then left behind as a finished, acquired asset. It must be maintained, refreshed and extended. ICT has an indispensable role to play in this, as it can bring educational materials to people. Additionally, it can bring people together in real and virtual communities. It can help them find what is available, thus matching aspirations with resources. Furthermore, ICT can provide measurement and assessment services, negating some of the cross-cultural and interpersonal biases that tend to creep into traditional systems of reward and assessment (EC, 2006). ICT allows people immediate access to a richer source of materials and difficult ideas are made more understandable when information technology makes them more visible. Educators therefore have vital roles in providing students with well-designed, meaningful tasks and activities.

Throughout the 1990s information and communication technologies (ICTs) increased in educational prominence. There was also growing interest with regards to ICTs being used to extend educational opportunities in developing countries. Whilst many governments paid specific attention to integrating ICTs into compulsory schooling during the 1990s, more recently the focus has shifted to *post*-compulsory education. In essence, it is argued that ICTs make post compulsory teaching and learning more effective and more equitable - offering a diverse range of learning opportunities to a diverse range of learners on a convenient and cost-effective basis (Selwynn, 2003).

Any degree of achievement of the objectives of adult education for development depends on the learning, participation, growth and change of a society; which in turn depends on information and interaction between groups, individuals and governments. To achieve these aims, adult educators recommend; the use of broadcast and print media; face to face communications which are specific to adult education programs; and the use of information. Information Communication Technologies (ICT) have the potential to significantly advance the progress towards to educational objectives, consequently the various forms of ICT supported learning are increasingly used for ‘Life Learning’ programs. ICT is fast becoming the accepted term of reference for contemporary information technologies - especially among governments across Europe, North America and South East Asia. ICT refers to a range of technological applications such as computer hardware and software, digital broadcast technologies, and telecommunications technologies such as mobile phones, and the Internet as well as electronic information resources such as the World Wide Web and CD/DVD-ROMs (Digby, and Bey, 2014 Huiying, & Jian, 2014).

This potential of ICT requires ICT facilities use to serve as a tool to circulate information and to induce a qualitative change in the society. In education ICT is particularly significant, as it has enormous potential in the reduction of educational inequalities, updating knowledge and enhancing the life of people. Therefore, recent research has placed emphasis on ICT for adult education and learning. New technologies and tools offer greater flexibility, easier access to information and the opportunity to equate learning to the needs of adult learners as well. Technological developments, such as the Internet, mobile communications and virtual environments, have created new possibilities for the support of learning. learning, naturally, is defined in many different ways. Analysis of adult learning allows for new insights into how to people learn - and what they need to learn - to adapt to changing economic and social conditions. Indeed, the opportunities of ICT feature heavily in EU policies on life-long learning. In its Communiqué entitled “Making a European Area of Lifelong Learning a Reality, which was adopted in 2001, the Commission notes the need to develop education and training measures for lifelong learning across the whole continent. Member States are

advised to adapt their formal education and training systems to the demands of the modern environment, breaking down barriers between different forms of learning, and giving all EU citizens the chance to develop ICT skills (EC, 2006). Similar initiatives have been introduced across not only in Europe, but in South America, South East Asia and Australasia. Moreover, lifelong learning is now also occupying an increasingly central position in the education and training policies of Turkey. The knowledge-based economy, along with changes in society, demographic changes and the impact of ICT, present adult learners with many potential benefits, as well as challenges. Although lifelong learning is gaining ground in Turkey, few adults can be said to benefit from it at present. To exemplify, only 2% of adults within the age range 25-65 currently participates in lifelong learning activities in Turkey (Herta et al., 2014).

ICT in Adult Education

Attempting to encourage full and effective participation in adult education forms a central part of current educational and economic policymaking in most developed countries, under the various guises of 'creating learning ages', 'clever countries' or 'learning societies'. As has already been hinted at, many governments have viewed ICT as having profound and far-reaching implications for the ways in which such aims might be realized. For example, in the United States, as in nations across Europe and South East Asia, the role of technology in post-compulsory education is currently of key political concern (see Eurodyce, 2002, Selwyn et al., 2001, Herta et al., 2014,).

The use of technology in adult education is not new. Adult educators have long used applications such as audio and videotapes, as well as overhead projectors, for their educational activities. More recently, educators started to integrate multimedia packages and PowerPoint presentations into education. Educators continue to explore and develop new uses of technology. They are not only using technology as an educational tool in the classroom, but also as a delivery system for educational activities and as educational content itself (for instance, the learning of word processing programs or the building of web pages) (Reder, 2013). Technology is evident in a range of different contexts: in the classroom, on distance learning sites, and for extended or self-study. This extreme adaptability is particularly appealing in a field with a wide variety of program types, content objectives, instructional settings, and learner needs and goals. At the classroom or individual learning level, new technologies provide opportunities to accomplish multiple educational goals (e.g. integrated language skills, critical thinking, and cooperative and interpersonal skills). Furthermore, technologies may also be responsive to different learning styles such as auditory, visual and so forth (Chaib, 2005).

The use of technology for professional development is a more recent phenomenon, one that is being explored for a variety of reasons, many similar those prompting the use of technology in instruction: to increase delivery options; to address wide, often dispersed audiences; to establish ongoing professional development opportunities and provide ways for practitioners to connect with each other, and to familiarize practitioners with technology so that they are prepared to incorporate it effectively into their own instructional practice (Hall, 2013. et.al).

Efforts to use ICT effectively in adult education comprise of addressing the need for adequate funding to support the technology's integration, in addition to the purchase of hardware, software and accompanying materials, and providing adequate, ongoing technical support for maintenance. Merely using technology is not enough for adult educators: developing new - or expanding existing - instructional delivery models is necessary for the successful integration of ICT. To develop proficiency in technological applications in Adult education, the incorporation of opportunities to develop such proficiency is a necessary provision (Moore, 2011). Hybrid models should be created and used to combine the technology component with elements such as accompanying print mate-

rials, conventional classroom settings and face-to-face education, in addition to developing appropriate and useful software programs and web sites at the adult education level. Practitioners must then be trained in instructional methods and techniques that may lead to effectively incorporating technology applications and subsequent usage of the equipment (Burt, 1999, Gear, 1998, Hacker 1999, Hawk, 2000, Terril, 2000). Fitzpatrick (2003) is among many who argue that new technologies should always be approached with a sense of cautious realism. In adopting a more critical and questioning approach towards ICT in adult education, it first makes sense to reconsider precisely why ICTs are seen to be beneficial for adult education. For more effective adoption, not only hardware but also software is important in how ICT is used for educational aims (Judson, 2010).

The integration of information and communication technologies can help revitalize both adult educators and students, thereby helping to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, adult educators need to be involved in collaborative projects and the development of intervention change strategies which would include teaching partnerships with ICT as a tool. Teacher's attitudes are a major predictor of the use of new technologies in instructional settings. Teacher's attitudes toward ICT shape not only their own ICT experiences, but also the experiences of the students they teach. According to Rogers (1995) one of the major factors affecting people's attitudes toward a new technology is the particular features of the technology itself. Rogers explains the five basic features of technology that affect its acceptance and subsequent adoption: relative advantage, compatibility, complexity, observability, and trainability. Thus, a new technology will be increasingly disseminated if potential adopters perceive that the innovation: (1) it has an advantage over previous innovations; (2) it is compatible with existing practices, (3) it is not excessively complex to understand and/or use, (4) it delivers observable results, and (5) it can be experimented with on a limited basis before adoption.

Research Questions

The purpose of this research study was to explore ICT usage, the factors that support its use, barriers that hinder its use, and self-perceptions on efficacy and level of expertise, as well as the relationship of variables among adult educators who work in adult education centers in Turkey. In order to shed light on these topics, this research study mainly focused on the following questions:

1. What ICT resources (software, instructional tools and materials) do adult educators use?
2. What are preferred methods for professional development of adult educators?
3. What implications encourage technology usage of adult educators?
4. What are the perceptions of adult educators on self-efficacy in terms of ICT usage?
5. What are the barriers that adult educators face?
6. Is there any relationship between awareness and the self-rated expertise level of adult educators and the self-perception of efficacy and self-rated expertise level of adult educators?
7. Is there any relationship between adult educators' usage of computer related tools in the classroom and their self-perceptions of efficacy?
8. Is there any relationship between adult educators' usage of computer related tools in the classroom and their level of expertise?

Methodology

Convenience sampling was used to obtain responses from the participants of this study. The participants were 276 adult educators from different adult education centers in Turkey.

The "Information and Communication Technology Usage Survey" (α = 0,91), adopted from Guven and Gulbahar (2005), was mainly derived from discussions found in the related literature (Iding, Crosby & Speitel (2002); Bielefeldt (2001); Haydn, Arthur & Hunt (2001); McCormick and

Scrimshaw (2001), Guven &Gulbahar (2005) was used to collect data for this study. The survey contained five parts. The first part of the survey consisted of 24 items regarding software use, as well as other instructional tools and materials. The second part contained 9 items concerned with preferences for professional development in terms of gathering information and support. The following part consisted of 8 items relating to the factors that encourage adult educators' usage of technology. In the fourth part of the survey there were 18 items concerned with perceptions of adult educators on self-efficacy. Finally, the last part composed of 19 items regarding the barriers that adult educators faced during technology utilization in the teaching-learning process.

Results

In this section of the study, the results are reported according to the research questions listed previously.

ICT resources used by adult educators

As stated, the participants in this study comprised 276 adult educators, 98.2% of whom have access to a computer at work and from among these 88.7% have access to the Internet. The adult educators' daily computer usage were found to be; 61.8% use less than one hour, 33.8% use between 1-3 hours, 2.8% use 3-5 hours and 1,5% use more than five hours a day.

The adult educators specified their level of expertise on thirteen types of computer software through a three-point likert-type scale (i.e. 2=Good, 1=Average and 0=None) (α=0,91). A majority of the participants (over 60%) rated their skills as average or high at word processing, spreadsheets, presentation software, and computer aided instructional software, web browsers, search engines, electronic mail, chat/forum, electronic encyclopedias and instructional films.

The adult educators indicated their usage of eleven types of instructional tools and materials, again through a three-point likert-type scale (2=Frequently, 1=Sometimes and 0= Never) (α=0, 86). According to rate of usage, the instructional tools used widely were; overhead projectors (f=208), television/video (f=198), multimedia computers and slide projectors (156), printed materials, boards (145), and radio cassette recorders (f=136). These findings differ greatly from the study of the regular school teachers, as the adult education is mainly based on learning by doing and on audio-visual settings.

Adult educators' preferred methods for professional development

Each adult educators specified their preferences about professional development and their responses, namely the accessing of knowledge (5 questions) and support services (4 questions), were garnered through a three-point likert type scale (2=I prefer, 1=Neutral and 0=I don't prefer) (α=0,91). Printed materials (99,4%), internet resources (83,4%), self-study (80,7%) and participation in seminars and workshops (79,1%) were most favored knowledge resources for professional development. Conversely, the majority of adult educators favored each and every kind of support service; experienced adult educators (96,9%), colleagues in the same field (87,7%) and the technical support group within the school (81,0%). These findings generally correlated with the findings of other studies on teacher usage of ICT in traditional school settings (Gulbahar & Guven, 2004, Albrini 2007)

The incentives that encourage technology usage of adult educators

In order to determine the incentives for ICT adoption within adult education, a three-point likert-type scale was used (i.e. 2=Important, 1=Neutral and 0=Not Important). Participants were asked to rate the degree of importance they placed on eight statements about incentives for ICT adoption (Table-1). All statements were rated as "important incentives" by at least 76% of the adult educators. (α=0,81).

Table 1. Percentage of Assessed Factors that Encourage Adult Educators' Technology Usage

Factors Encourage Technology Usage	Important (%)	Neutral (%)	Not Important (%)
Rewarding the technology usage efforts of adult educators in instructional activities	90,6	4,3	5,1
Investments of the institution in infrastructure of instructional technologies	95,7	3,3	0
Investments of the institution in in-service education programs for instructional technologies	95,3	4,7	0
Investments of the institution in the support services of instructional technologies	85,3	10,1	1,1
Developing the policies and plans for diffusion of the instructional technologies	90,3	6,5	3,2
Providing support for the projects towards the expansion of instructional materials	95,7	2,5	1,8
Carrying out studies for integration of technology into the curriculum	89,6	7,9	2,5
Reducing work load to provide opportunities to adult educators for developing instructional materials	76,6	20,1	3,2

Adult educators' perceptions on self-efficacy about ICT usage

Another important category of study was the self-efficacy perceptions of adult educators in terms of ICT usage. The participants rated their perceptions through a three-point likert-type scale (i.e. 2=Agree, 1=Neutral and 0=Disagree) in order to specify their perceptions of 18 statements about the usage of computers and instructional technologies (α=0,82) (Table-2). The results illustrated the fact that, while adult educators are aware of the advantages which technology will bring them, they nevertheless lack the basic skills in computer usage, as well as in the other technologies which could also be used as a supplement in the classroom.

Table 2. Perceptions of Adult educators about perceived self-efficacy on ICT Usage

Perceptions	Agree (%)	Neutral (%)	Disagree (%)
I don't use computers as much as other resources (books, overhead projectors etc.) for instructional purposes.	51,4	16,3	32,2
I discern what to do when using computers in instructional environments.	55,4	26,4	18,1
I am conscious about opportunities that computers offer	44,8	32,1	23,1
I can response any question that my students ask about computers.	27,0	28,5	44,4
I am not sure that I am computer-literate for computer use in my classes.	40,8	26,4	32,5
I don't want to use computers.	16,2	17,3	66,4
I think that I can use instructional technologies in class activities more effectively on a daily basis.	70,9	18,7	10,1

Perceptions	Agree (%)	Neutral (%)	Disagree (%)
I believe that tools like e-mail, forums and chat will make communication with my colleagues and students easier.	81,9	10,9	7,2
I think that technology supported teaching makes learning more effective.	87,1	6,1	6,1
I think that the use of instructional technologies stimulate the interest of students toward courses.	86,7	5,4	7,2
I think that the use of instructional technologies increases the quality of courses.	88,8	5,8	5,4
I think that usage of instructional technologies makes it at ease to prepare course materials (assignments, handouts etc.).	85,4	9,1	5,5
It is hard for me to explain the use of computer applications to my students.	43,7	23,1	33,2
I can handle the different learning preferences of my students having different learning styles through using instructional technologies.	42,6	29,2	28,2
I think that technology usage makes effective usage of class time.	77,1	16,7	11,2
I think that using instructional technologies makes me more productive as a teacher.	83,8	11,2	4,7
I think that using technology makes it easier to reach instructional resources.	87,0	6,9	6,1
I don't prefer to be assessed in my use of instructional technology-based applications by any other professional.	41,1	29,8	29,1

Barriers adult educators face during technology usage

The participants were again asked to use a three-point likert-type scale (i.e. 2=Agree, 1=Neutral and 0=Disagree) to rate their level of agreement with regard to 19 statements about barriers to ICT adoption (α=0,89) (Table-3). 17 statement (out of 19 statements) have been regarded as being major barriers to the adoption of technology into teaching-learning process by more than 50% of adult educators. Among those 17 statements, the top three are; (1) inefficient usage of computer laboratories and inadequate infrastructure, (2) inefficiency of adult educators' technical knowledge in the preparation of materials based on technology and the inadequacy of technology courses offered to students, (3) the non-existence of incentives for the encouragement of technology usage.

Table 3. Percentage of Assessed Barriers that Adult Educators' Faced During Technology Usage in Teaching-Learning Process

Barriers to Technology Usage	Agree (%)	Neutral (%)	Disagree (%)
Inadequacy t time to prepare materials centered on technology	54,7	17,0	28,3
Inadequacy of technical knowledge of adult educators in arranging materials based on technology	64,2	24,3	12,5
Difficulties regarding the accessibility to existing hardware (computer, overhead projector etc.)	59,4	16,7	23,9

Barriers to Technology Usage	Agree (%)	Neutral (%)	Disagree (%)
Disorganization of institutions' computer laboratories	74,1	9,5	16,4
Ineffectiveness of institutions technical infrastructure about instructional technology	65,2	17,7	37,1
Inefficient number of complimentary resources (printer, scanner etc.) for effective use of computers	62,3	11,0	26,4
Scarcity of computers used by adult educators	57,0	18,1	24,9
Deficiency of reward systems for encouraging technology usage	61,2	19,3	19,5
Poor technical and physical infrastructure of learning environments.	68,5	18,8	12,7
Inadequacy of computers used by learners	59,0	25,3	15,8
Poor guidance and support by administration	55,4	20,3	23,9
Lack of financial resources for technology integration	62,6	21,2	15,0
Wastefulness of instructional software/electronic resources	59,0	24,1	16,2
Shortage in resources on technology for attaining information	54,7	19,1	25,9
Deficiency in professional development opportunities for gaining knowledge and skill	54,3	28,4	16,9
Deficiency in support services in material development/technology usage	59,4	21,1	18,7
Lack of interest of adult educators in technology usage	66,6	12,9	20,2
Difficulties of improper teaching methods for technology usage	54,6	24,4	16,1
Inadequacy of the courses of technology offered to students	70,1	19,5	10,1

Relationship between awareness and self-rated expertise level of adult educators and between self-perception of efficacy and self-rated expertise level of adult educators

Correlation analysis was conducted to determine the relationship between awareness and the self-rated expertise level of adult educators and, between the self-perception of efficacy and self-rated expertise level of adult educators. The results indicated that there is no significant relationship between awareness and self-rated expertise level of adult educators. However, it was found that there is significant correlation between self-perception of efficacy and self-rated expertise of adult educators. (Pearson r=.0,532, p<0,01) (Table-4).

Table 4. Correlational Analysis between Self-perception of Efficacy and Self-rated Expertise Level of Adult Educators

		Computer Software Usage	Self-Perceptions
Computer Software Usage	Pearson Correlation	1	,532**
	Sig. (2-tailed)	,	,000
	N	262	276
Self-Perceptions	Pearson Correlation	,532**	1
	Sig. (2-tailed)	,000	,
	N	276	262

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

Relationship between usage of computer related tools in classroom and self-perceptions of efficacy of adult educators

To determine the degree of variance for attitudes of adult educators towards ICT in education that could be explained by the selected independent variables, simple correlations were performed. Simple correlations (using Pearson and Spearman analyses) were first undertaken in order to identify independent variables that individually correlate with self-perception of efficacy and usage of related tools in the classroom for each of the four tools: multimedia computers**,** computer-aided educational software, computer-projector systems and the Internet/Web Environment.

Follow-up tests were conducted to evaluate pair wise differences among the means. The results of these tests, as well as the means and standard deviations for multimedia computers, computer-aided educational software, computer-projector systems and the Internet/Web environment are reported in Table-5. The results indicated that the group who sometimes/frequently use multimedia computers and computer-projector systems in classrooms has higher self-perception of efficacy than the groups that never use these tools. Also, the groups that frequently use educational software and the Internet/Web environment have higher perception of efficacy than the ones that never use them. In other words, those adult educators who have high perception of efficacy tend to use computer related tools more frequently than the others in the classroom

Table 5. Correlational Analysis Indicating the Relationship between Usage of Computer Related Tools in Classroom and Self-perceptions of Efficacy of Adult Educators

		Computer Software Usage	**Self-Perception of Efficacy**
Computer Software Usage	Pearson Correlation Sig. (2-tailed) N	1 , 265	,523** ,000 276
Self-Perception of Efficacy	Pearson Correlation Sig. (2-tailed) N	,523** ,000 276	1 , 265

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

Relationship between usage of computer related tools in classroom and level of expertise of adult educators

The expertise level of adult educators in the classroom is another motivating factor for adult educators' more effective use of ICT. The expertise level of adult educators was analyzed. A correlation analysis was conducted to determine if there is any relationship between adult educators' use of computer related tools in the classroom and the expertise level of adult educators. A one-way analysis of variance was conducted to evaluate the relationship between level of expertise and computer related tools usage for each of the four ICT tools.

Again, follow-up tests were conducted to evaluate pair wise differences among the means. The results indicated that the groups that sometimes/frequently use computer related tools in classrooms have higher levels of expertise than the groups that never use them. In other words, adult educators who have a high level of expertise tend to use computer related tools in the classroom more frequently than the others.

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Table 6. Correlational Analysis Relationship between Usage of Computer Related Tools in Classroom and Level of Expertise of Adult Educators

		Computer Software Usage	Level of expertise
Computer Software Usage	Pearson Correlation	1	522**
	Sig. (2-tailed)	,	,000
	N	271	268
Level of expertise	Pearson Correlation	,522**	1
	Sig. (2-tailed)	,000	,
	N	268	271

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

Relationship between having computer at home and expertise level of adult educators

An independent-samples t-test was conducted to discover if there is a relationship between having a computer at home and the expertise level of adult educators. The results indicate that adult educators who have computer at home do have higher levels of expertise than those who do not (t (276)=-3,891, p<0,01, Means 10,3849 vs 4,8261).

Discussion

Information and communication technology (ICT) is intertwined with an unprecedented global flow of information, products, people, capital and ideas, connecting vast networks of individuals across geographic boundaries at negligible marginal cost. Moreover, ICT is an important part of the policy agendas in both formal and informal educational settings, with obvious profound implications for education, due to the fact that ICT can facilitate new forms of learning. This study has shed light on how adult educators are currently using ICT. Adult educators reported frequent use of ICT, while some reported frequent use of the Internet as a research tool and frequent use of word processing software, both of which have educational potential. The vast majority of adult educators are confident in performing basic ICT tasks such as opening, deleting and saving files. Conversely, few adult educators are confident in performing high-level tasks such as creating a multi-media presentation or writing a computer program. ICT appears to reinforce existing patterns of learning and seems to be more beneficial to people who are already learners, or who would become learners without access to ICT.

Dramatic and rapid changes in ICT have brought about the unavoidable diffusion technology in education. Research concerning controlled instructional environments indicates that the use of technology in the 'right place and time' may enhance the quality of educational outcomes. Additionally, educators regard incorporation of technology in preparing learners as necessary. This study has investigated the perceptions and ICT usage of adult educators. The use of ICT in instruction has been recognized as an important factor for the success of technology integration in education. Adult educators are aware of the benefits of using ICT in non-formal education by pointing out that ICT is a viable educational tool that has the potential to bring about various improvements in adult education centers.

The findings of the study demonstrate that there is a strong correlation between adult educators' attitudes toward ICT in education and their perceptions of computer attributes. However, adult educators' perceptions of the compatibility of ICT within their current teaching practices were not so positive. Adult educators pointed out that their class time is too limited for effective ICT usage. Hence, the effective implementation of ICT innovations into education requires promoting the structural, pedagogical and curriculum approaches. This finding reinforces that of Albrini, who urges that

cultural perceptions should be taken into consideration. This conclusion points out a need for consideration of cultural factors in studies conducted in developing countries (Albrini, 2006).

This study has examined the extent to which adult educators have access to ICT for a variety of activities. Adult educators most frequently use computers for accessing information on the Internet, for communicating, for word processing and preparing slide presentations. Only a small number of adult educators stated they use ICT to help them learn new material, and less than one-fifth reported they regularly use educational software. Some adult educators reported to use ICT for programming, drawing, graphics or analyzing data with spreadsheets but these were extremely rare occurrences.

In addition to these, adult educators stated that they participated elective courses and other short in-service training courses and workshops for professional development. They also implied the necessity of sharing experiences and the need for discussion about new technologies and contemporary issues, as well as requiring support when trying to keep up with new developments in ICT. In addition to longer practical work, adult educators needed more resource materials such as supplementary workbooks and a resource center where they could find teaching materials and new ideas.

The majority of the participants were aware of the importance of using ICT in their own teaching. Nevertheless, a lack of confidence in applying ICT in their teaching was a very important finding. All participants maintained a growing tendency towards applying ICT in their teaching on a regular basis. Therefore, these results show that ICT training would undoubtedly enhance the adult educators' skills in pedagogical and technical use of the ICT-based learning program components and increased motivation to use ICT. Inefficiencies in participant's technical knowledge to prepare materials based on technology further highlighted the importance of in-service training and correlated with the impact on instructional tools and materials usage.

Additionally, adult educators are not equipped with knowledge of possible technologies that could be helpful in teaching and therefore the majority does not use ICT to a great extent. On the other hand, numerous kinds of professional development opportunities and support services were highly valued, showing the willingness of adult educators to learn, as well as the current inadequacy of in-service training opportunities. What are the perceptions of adult educators on self-efficacy in terms of ICT usage? It is necessary for adult educators to have the skills, knowledge and attitudes necessary to infuse it into the curriculum. In other words, adult educators need to become effective agents to be able to make use of technology in education.

The results showed that adult educators are willing to use ICT resources, although problems regarding the accessibility of ICT resources, coupled with the lack of in-service training opportunities, greatly hindered them. Moreover, problems with personal, reinforcing and enabling factors need to be solved when planning ICT-based in-service teacher training.

Introduction of ICT into education requires equal degrees of innovation in other aspects of education. Adult educators' low level of access to ICT tools, their lack of technological infrastructure and aids are additional barriers in ICT usage. Adult educators who had few ICT skills maintained that the main barriers facing them were their lack of knowledge and the skills with computers that would enable them to make "informed decisions". The results on self-efficacy validated the findings in terms of both the inefficient use of technology due to lack of knowledge and the strong belief in the potentials of using technology both inside and outside of class activities.

In addition, the results once more demonstrated that most of adult educators are computer-illiterate to a large extent and that they desperately need in-service training. This finding also correlated with the notion that the major barrier suffered by almost all of the adult educators was the "inefficiency of adult educators' technical knowledge to prepare materials based on technology". The

findings show that adult educators have great awareness (Mean =15,24, SD 1,27) but low expertise level (Mean=9,96, SD 6,74), which also indicated the lack of necessary in-service training opportunities.

Effective usage of ICT in education is a complex process in which many agents play different roles. Forces that may influence ICT usage in non-formal education also should be taken into consideration. Studies about ICT and its effect on teacher's competence have suggested overlooking the psychological and contextual factors involved in ICT applications. However, one should keep in the mind that successful implementation of educational technologies depends largely on the attitudes of educators, who ultimately determine how they are used in the classroom. As this research indicates, attitude of adult educators is a major determining factor in the adaption of technology. As Rogers (1995) claims, attitudes toward new technology are very important in its effect and diffusion. He uses the terms innovation and technology interchangeably (p. 12), and states that diffusion of the innovation framework seems particularly suited to the study of the diffusion of ICT. This suggests that studies of the early stages of technology implementation should focus on the end-users' attitudes toward technology.

Conclusion

ICT can help to enhance programs and improve the skills of adult educators. Nevertheless, programs need financial resources to acquire technology and subsequently support to use technology, particularly as applications become more sophisticated, extensive and expensive. Educators always need training and support to incorporate technology consistently and effectively into instruction. Increasing investment in ICT - and its usage with a high-end technology application - can lead to a successful adoption of applications. While computers and Internet play an ever growing role in adult learners' and educators' life, both at work and home, there are still segments of both populations who could benefit from easier access to this type of technology and the information it conveys (Terrill, 2000a).

As a developing country, Turkey is attempting to foster a culture of acceptance amongst the end-users of ICT. Nevertheless, individual attitudes are indispensable in the usage of ICT in the classroom. Thus, one should keep in mind that adopting ICT is a twofold process: one is human, the other is technological. Certain restrictions, such as inadequate ICT infrastructure and low ICT skills of adult educators are important barriers to effective ICT usage in adult educators. Therefore, it is necessary to promote these skills as a prerequisite for deriving benefit from ICT facilities. The mismatch between ICT and existing curricula, together with the class-time frame, are other barriers. Simply placing ICT within adult education centers is not enough to achieve educational change, as it requires equal degrees of innovation in other aspects of education. Both policy-makers and adult educators share this responsibility. Policy-makers should provide the additional planning time for adult educators for having experience new ICT-based approaches. Reducing the teaching load for the adult educators may enable this. In order to involve adult educators in the process of technology integration, effective ways and measures should be found to overcome the barriers they face.

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