



Impact of information and communication technology on English language teaching (Case study: English language teachers in Mashhad)

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Abstract

Purpose of our current research is the study on the relationship between Information and communications technology in teaching English language.

Our target populations were all the English teachers of three district in Mashhad, which were chosen by random sampling method. Research measuring tool is a questionnaire with the full number of 79 questions in 6 sections computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics (including computer training background) Were the subject to research with the help of SPSS software version 18. The result showed variables of Computer attributes, Cultural perceptions, Computer competence, Computer access, Training be investigated independently, will have a positive relation with teachers' attitude.

Keywords: Information and communications technology, teaching English, English teacher



1- Introduction

The last two decades have witnessed a worldwide proliferation of information and communication technologies (ICT, henceforth) into the field of education. The global adoption of ICT into education has often been premised on the potential of the new technological tools to revolutionize an outmoded educational system, better prepare students for the information age, and/or accelerate national development efforts. In developing countries in particular, the above promises have generated a whole set of wild speculations about the necessity of educational reforms that will accommodate the new tools (Pelgrum, 2001).

ICT use in general terms is any use of “computing devices such as desktop computers, laptops, handheld computers, software, or Internet in K-12 schools for instructional purposes” (Hew & Brush, 2007, p. 225). However, more specifically it refers to the use of technology by teachers for instructional preparation, instructional delivery, and technology as a learning tool for students (Inan & Lowther, 2010).

EFL teachers use ICT tools for preparing teaching materials and activities to be used in teaching pronunciation (Lee, 2008), grammar (Al-Jarf, 2005), vocabulary (Tsou, Wang, & Li, 2002), listening and speaking (Hochart, 1998), communication skills (Lee, 2002), reading (Akyel & Ercetin, 2009), and writing (Chikamatsu, 2003). They also use technological tools such as PCs, laptops, or mobiles in the classroom for instructional delivery very effectively and frequently. Learning applications prepared by teachers/students or commercially produced ones such as drills, tutorials, and computer-based tasks are used in the classroom to promote collaborative learning of English skills (Beatty & Nunan, 2004). Furthermore, EFL teachers use computer-mediated-communication (CMC) or software as a tool for making authentic and meaningful communication (Mahfouz & Ihmeideh, 2009). In this way technology can provide learners with a range of authentic materials and tasks that have a positive influence on their autonomy.

Unfortunately, the implementation of technology into the Iranian English learning institutes has not been guided by research. This has often been the case in most countries across the world. In particular, the technology implementation plans seem to be lacking consideration of teachers’ reaction to the new tools. Such inattention to the end-users attitudes may engender unforeseen repercussions for ICT diffusion in Iranian English learning institutes. In his theory of Diffusion of Innovations, Rogers (1995) considers adopters’ attitudes indispensable to the innovation-decision process. A number of studies have shown that teachers attitudes toward computers are major factors related to both the initial acceptance of computer technology as well as future behavior regarding computer usage (Koohang, 1989; Selwyn, 1997).

The introduction of information and communication technologies (ICT) into schools is a world-wide phenomenon, not only among the developed countries, but also among developing countries. In the previous decades, this was an option that developed countries took, but today it has become a need for all schools. ICT has emerged as an indispensable tool for teaching and learning as well as a lever that helps to bring about change in schools (Venezky, 2002).

The reality in our societies (and more so in Iran) is that through ICT, the natural resource poor country has everything to gain from educating its citizens in the use of ICT in everyday life. In particular, the performance of learners in communication skills, foreign languages, mathematics and science remains lacklustre. Through the introduction of ICT in schools, the acquisition of effective skills in their use, the infusion of new teaching and learning methods using ICT and community involvement, there is trust that performance in these areas is bound to improve (Tikly et al (2003), Wagner, Day and Joseph (2004), Isaacs (2002), Gerster and Zimmermann (2005).



Literacy in Information and Communication Technologies (ICT) is fundamental to life in our modern technological society. To equip students to be literate life long learners and global citizens of the 21st century we must successfully integrate ICT into both the English curriculum and English pedagogical practice.

ICT is a valuable tool to enhance teaching and learning. For teachers ICT is a professional resource, a mode of classroom delivery, and a source of valid and valuable text types. For students, ICT provides opportunities to communicate more effectively and to develop literacy skills including skills in critical literacy. It is a valuable tool for researching, composing and responding, and viewing and representing in English.

ICT has many benefits for the classroom teacher. Using presentation software enables teachers to show ideas dynamically (Moseley et al 1999), and deliver content effectively. For example, CD-ROMs make vivid multimedia worlds available and store large amounts of information that teachers suddenly have at their fingertips. (McKnight (2002)

Most importantly however, the use of ICTs in the classroom signals a shift from the conventional position of power held by the teacher to a more collaborative approach to learning. Generally computer based activities allow the teacher to assume the role of facilitator whilst students take on an increasing responsibility for their own learning The use of computer-based technologies can shift the emphasis of activities away from the teacher and towards the students, enhance social interaction, (DET Computer Based Technologies in the English KLA,1997, pps8- 9), and be empowering especially for students with low traditional literacy skills (Interactive Education,2006)

Teachers can use a range of teaching tools such as discussion boards, forums, email, raps, web quests, video and digital photography, e movies, and even mobile phones as tools for delivery of class program. This opens reciprocal dialogue between members of the class community and may be extended to the school community at large through activities such as bloggs and wikis,(Kinzie, 2005, pB01)

English language is a necessity of for most people in today's world, while technology development always has a very high and also contributed towards the development of education, especially English. As English is one of difficult lessons, teacher must create interactive teaching and learning to make students interest. In the history of the development of education, information technology is part of the medium used to convey the message of science to many people, ranging from printing technology a few centuries ago, such as printed books, such as telecommunications to media, voice recorded on tape, video, television, and CD. According to Kent "ICT in education point of view refers to "information and communication Technology (ICT) such as computers, communications facilities and features that variously support teaching, learning and a range of activities in education (QCA Schemes of Work for ICT in Kent Country Council. 2004). Moreover, the term information and Communications Technologies includes technologies in which the computer plays a central role, i.e. Computer Assisted Language Learning (CALL), the internet, and variety of generic computer application (Fitzparick and Davies, 2002)

This research project inquires into the use of information and communication technologies for English language teaching in Mashhad.

this study explored the attitudes of English as a Foreign Language (EFL) teachers in Iran toward ICT. In addition, the study investigated the relationship between computer attitudes and five independent variables: computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics (including computer training background).

This study Given the importance of teachers attitudes and the relationship of teachers attitudes to the above variables, the purpose of this study is therefore to determine EFL teachers attitudes toward ICT in Iran education and then to explore the relationship between teachers attitudes and factors that are



thought to be influencing them, including perceived computer attributes, cultural perceptions, perceived computer competence, and perceived computer access. Teachers personal characteristics (gender, age, income, teaching experience, Institute location, education, and teaching methods as well as computer training background) were also included in order to ensure maximum possible control of extraneous variables by building them into the design of the study (Gay & Airasian, 2000).

The study focus mainly on EFL teachers because they were first to experiment with computers in the Iran context.

This is partly because of their familiarity with English as “the main computer language” and also because much of the available software is for English language practice. Moreover, “The field of foreign language education has always been in the forefront of the use of technology to facilitate the language-acquisition process” (Lafford & Lafford, 1997, p. 215).

Teachers should become effective agents to be able to make use of technology in the classroom. Ultimately, teachers are the most important agents of change within the classroom arena. To this end the research will attempt to answer the following questions:

1. What are the attitudes of institute EFL teachers in Iran toward ICT in education?
2. What are the teachers perceptions of:
 - a. Computer attributes?
 - b. Cultural relevance of computers to Iran society and institute?
 - c. Their level of computer competence?
 - d. Their level of access to computers?
3. What is the proportion of the variance in the attitudes of teachers toward ICT in education that can be explained by the selected independent variables (as well as teachers personal characteristics) and the relative significance of each independent variable in explaining the dependent variable?

2-Methodology

The study method was survey research in which data were collected using a questionnaire. The study population is included all English teachers of three district in Mashhad that the number of participants were 360 . In this study, to determine the sample size based on Cochran-grade 95% and a maximum permissible error of 5% of individuals were randomly selected samples and questionnaires were distributed among them.

The development of questionnaire was guided by extensive review of literature and scales used in different educational backgrounds (Al-Oteawi, 2002; Bannon, Marshall, & Fluegal, 1985; Bear, Richards, & Lancaster, 1987; Christensen & Knezek, 1996; Gardner, Discenza, & Dukes, 1993; Gressard & Loyd, 1986; Harrison & Rainer, 1992; Isleem, 2003; Jones & Clarke, 1994; Meier, 1988; Na, 1993; Robertson, Calder, Fung, Jones, & OShea, 1995; Sooknanan, 2002; Swadener & Hannafin, 1987).

The questionnaire consisted of six scales that correspond to the main variables of the study To assess the validity of the questionnaire used in this research, we used the content validity method of the questionnaire by giving them to experts in the field of English language teaching and they were asked to express their opinions in this case. Cronbach's alpha was used to measure the reliability of the questionnaire

Table 1 shows the calculated amount of Cronbach's alpha coefficients for the variables, according to the results of the variables, they are highly reliable.

Table 1: Cronbach's alpha coefficients

Variables	Cronbachs coefficients
computer attitude	0.9
computer attributes	0.86

cultural perceptions	0.76
computer competence	0.94

The computer access scale consisted of three statements that took into account possible locations where computers might be available for use by EFL teachers: at home, in school, and other places. Demographic variables were quantified by individual scores on eight items. The responses to all eight items were treated separately as descriptive information that was correlated with the attitudes toward ICT.

To analyze the descriptive statistics data (to display demographic information) and inferential statistics, we were using SPSS statistical software version 18.

3- Main findings

3-1 Research question one: teacher's attitudes toward ICT in education

Participants were asked to respond to 20, Likert-type statements dealing with their attitudes toward ICT in education. The items were designed to measure the affective domain of computer attitude (items 1–6), cognitive domain (items 7–15), and behavioral domain (items 15–20). Computer attitudes of EFL teachers was represented by a mean score on a 5-point scale, where 5 (Strongly Agree) represents the maximum score of the scale and 1 (Strongly Disagree) represents the minimum score. Table 1 illustrates the distribution of mean scores on the Attitude toward ICT scale. As Table 1 illustrates, teachers overall attitudes toward ICT were positive with an overall mean score of 3.97 (SD = 0.41). The respondents positive attitudes were evident within the affective (mean =5.00), cognitive (mean =4.09) and behavioral (mean =4.13) domains. Ninety-six point three percent (96.73) of the respondents had positive (75.03) or highly positive (21.7) affect toward computers. These respondents reported that they had no apprehension of computers, were glad about the increase of computers, considered using computers enjoyable, felt comfortable about computers, and liked to talk with others about computers and to use them in teaching. Within the cognitive domain, most of the respondents agreed (65.13%) and strongly agreed (20.8%) that computers save time and effort, motivate students to do more study, enhance students learning, are fast and efficient means of getting information, must be used in all subject matters, make schools a better place, are worth the time spent on learning them, are needed in the classroom, and generally do more good than harm. In the behavioral domain, the majority of the respondents expressed positive (57.31%) or highly positive (30.7%) behavioral intentions in terms of buying computers, learning about them, and using them in the near future.

Table 2: Distribution of mean scores on the attitude toward ICT scale

Scale	Percent (%)					Mean	SD
	SD	D	N	A	SA		
Affect	0.21	0.7	14.02	75.03	21.7	5.00	0.5
Cognition	0.01	0.89	12.34	65.13	20.8	4.09	0.5
Behavior	0.27	2.4	9.12	57.31	30.7	4.13	0.4
Overall attitude	0.02	0.51	7.08	34.28	21.23	3.97	0.41

SD, strongly disagree (1); D, disagree (2); N, neutral (3); A, agree (4); SA, strongly agree (5).

3-2 Research question two: teachers' perceptions in terms of factors related to attitudes toward ICT

3.2.1. Computer attributes

Participants were asked to respond to 18, Likert-type statements dealing with their perceptions about the relative advantage of computers (items 1–5), their compatibility with teachers current practices (items 6–10), their simplicity/non-complexity (items 11–14), and their observability (items 15–18). Overall, respondents perceptions of computers attributes were somewhat positive with an overall mean score of 4.08(SD = 0.41) (Table 2).

Respondents positive perceptions varied across the four computer attributes examined in this study. Teachers responses were most positive about the relative advantage of computers as an educational tool (mean = 5.00; SD = 0.51). Less positive were teachers perceptions of the compatibility of computers with their current practices (mean = 4.33; SD = 0.53). While the majority of respondents indicated that computer use suits their students learning preferences and level of computer knowledge and is appropriate for many language learning activities, most of them were uncertain about whether or not computer use fits well in their curriculum goals, and the majority reported that class time is too limited for computer use. Similarly, teachers perceptions of the simplicity of computers (i.e., “complexity” before the negative items were reversed) were also midway between neutral and positive (mean = 5.21; SD = 0.63). Most of the teachers responses were split between positive and neutral about whether it is easy to understand the basic functions of computers, operate them, and use them in teaching. Lastly, teachers responses on the observability subscale indicate somewhat positive perceptions (4.01, SD = 0.55). Most of the respondents reported that they had seen computers at work and as educational tools in general and in the Syrian educational context in particular.

Table 3: Distribution of mean scores on the computer attributes scale

Scale	Percent (%)					Mean	SD
	SD	D	N	A	SA		
Advantage	0.28	0.62	16.02	72.03	19.7	5.00	0.51
Compatibility	0.3	0.75	14.34	52.22	24.8	4.33	0.53
Complexity	0.0	2.4	9.12	54.54	29.7	5.21	0.63
Observability	0.0	0.51	7.08	31.77	21.23	4.01	0.55
Overall attributes	0.0	0.9	21.02	88.03	21.7	4.08	0.41

SD, strongly disagree (1); D, disagree (2); N, neutral (3); A, agree (4); SA, strongly agree (5).

3-2-2 Cultural perceptions

In general, participants responses to the 16 items on the Cultural Perceptions scale were somehow midway between neutral and positive (mean = 4.08, SD = 0.5) (Table 3).

The majority of the respondents had positive (54.3%) or highly positive (18.98%) perceptions about the relevance of ICT to Mashhad society and English teaching institute. Notably, most of the respondents indicated that students need to know how to use computers for their future jobs. Moreover, most of them stated that computers will contribute to improving their standard of living and that knowing about computers earns one the respect of others and ensures privileges not available to others. In addition, the majority of the respondents indicated that computers do not increase their dependence on foreign countries, dehumanize society, or encourage unethical practices. However, the fact that respondents saw ICT as culturally appropriate for Mashhad institute and society did not prevent them to indicate that there are other social issues that need to be addressed before implementing computers in education, that computers are proliferating too fast, and that alternative computers which better suit Persian culture and identity are needed.

Table 4: Cultural perceptions

Scale	Percent (%)					Mean	SD
	SD	D	N	A	SA		
Cultural perceptions	0.28	1.0	9.78	54.3	18.98	4.08	0.5

SD, strongly disagree (1); D, disagree (2); N, neutral (3); A, agree (4); SA, strongly agree (5).

3-2-3 Computer competence

Computer competence was represented by a mean score on a 4-point, scale ranging from 1 (no competence) to 4 (much competence). Table 4 illustrates the distribution of mean scores on the 15-

item computer competence scale. The majority of the respondents had no (51.02%) or little (37.47%) computer competence in handling most of the computer functions needed by educators. Sixteen point six (17.11%) of the respondents had moderate computer competence, and less than one% (0.71%) possessed much competence. On average, the respondents reported that they had “Little Competence” (mean = 1.52; SD = 0.51) in computer uses, including software installation, printer usage, productivity software, telecommunication resources, basic troubleshooting, graphic application, grade keeping, educational software evaluation, organization tools, and virus removal.

Table 5: Distribution of mean scores on the computer competence scale

Scale	Percent (%)				Mean	SD
	No competence	Little competence	Moderate competence	Much competence		
Computer competence	51.02	37.47	17.11	0.71	1.52	0.51

3-2-4 Computer access

Participants were asked to rate their level of access to potential computer places: at home, school and other places. Computer access of EFL teachers was represented by a mean score on a 5-point scale ranging from 1 (Never) to 5 (Daily) (Table 5). As Table 5 illustrates, “Home” was the respondents most frequent place of computer access with 59.88 (59.88%) of them having access to it either daily (25.21%), biweekly or three times a week (9.01%), weekly (6.84%), or monthly (7.77%).

Other (the respondents had access to computers in places other than home and school.) These places included Internet cafes, friends, relatives, university, and private work. came second with 28.79 (28.79%) of the respondents having access to it either daily (2.19%), biweekly or three times a week (4.28%), weekly (6.68%), or monthly (12.27%).

Only (28.65%) of the respondents had access to computers in school. The mean score on the Computer Access scale was 1.65 (SD = 0.75), which indicates that a typical teacher had access to computers almost once a month.

Table 6: Distribution of mean scores on the computer access scale

Scale	Percent (%)					Mean	SD
	Never	Once a month	Once a week	2-3 Times a week	Daily		
Home	40.12	7.77	6.84	9.01	25.21	2.71	1.63
School	71.35	12.4	6.47	7.82	8.09	1.64	1.08
Other (cafe's, friends, relatives, university, work)	71.21	12.27	6.68	4.28	2.19	1.31	0.84
Overall access level	37.28	34.17	16.27	6.66	0.27	1.65	0.75

3-3 Research question three: proportion of variance in teachers' attitudes explained by the independent variables

To determine the proportion of the variance in the attitudes of teachers toward ICT in education that could be explained by the selected independent variables, a multiple regression analysis was performed. Following Gay and Airasians (2000) recommendations, simple correlations (using Pearson and Spearman analyses) were first performed to identify independent variables that individually correlate with the dependent variable (attitudes toward ICT). These variables were used in the multiple regression equation to make a more accurate prediction of the dependent variable and to show the

proportion of variance in the dependent variable explained by the selected independent variables. Spearman rank correlations yielded no significant relationships between teachers attitudes and any of the demographic variables (with the exception of computer training background). The summary of the multiple regression results are presented in Tables 6 and 7. The results indicated that 45% of the variance in computer attitude was explained by the independent variables included in this study (Table 6). The test statistic was significant at the 0.05 level of significance ($F= 88.24$; $p < 0.05$). As Table 7 illustrates, the results of multiple regression indicate that three variables affect the teachers attitudes toward ICT at the 0.05 level of significance. The following are the absolute T values of the standardized estimate (b) of these factors from largest to smallest: computer attributes ($b = 0.55$, $t = 12.07$, $p < 0.001$), cultural perceptions ($b = 0.28$, $t = 5.09$, $p < 0.001$), and computer competence ($b = 0.105$, $t = 2.24$, $p < 0.002$). The analysis suggests that the independent variables explaining the greatest amount of variance in computer attitudes are in order of predicative value: computer attributes, cultural perceptions, and computer competence (Table 7).

Table 7: Analysis of variance

Sources	Sum of squares	DF	Mean square	F value	R ²	Adjusted R ²	P
Model	45.21	6	8.51	88.24	0.48	0.45	<0.002
Error	32.00	185	0.023				
Total	75.39	185					

Table 8: Multiple regression on dependent variable (computer attitude)

Variable	Unstandardized b	Standardized b	t	P
Computer attributes	0.62	0.55	12.07	<0.001
Cultural perceptions	0.23	0.28	5.09	<0.001
Computer competence	0.061	0.105	2.24	<0.002
Computer access	0.036	0.061	1.13	0.149
Training	0.018	0.021	0.61	0.218

4- Conclusions

We live in a time change. Gelatt (1995) stated that change itself has changed. Change has become so rapid, so turbulent, and so unpredictable that is now called "white water" change. Murphy & Terry (1998) indicated the current of change move so quickly that they destroy what was considered the norm in the past, and by doing so, create new opportunities. But, there is a natural tendency for organizations to resist change. Wrong conceptions about the use of technology limit innovation and threaten teachers' job and security (Zuber-Skerritt, 1994). Instructors are tend not to use technologies that require substantially more preparation time, and it is tough to provide instructors and learners access to technologies that are easy to use (Herschbach, 1994).

Aim of this research is to deliberate for the relation between using information and communication technology and teaching English language. In overall terms base on the results of statistical samples, it can be declared that, when the variables of Computer attributes , Cultural perceptions , Computer competence , Computer access , Training be investigated independently, will have a positive relation with teachers' attitude.

According to the effects of ICT on teaching system and its role on student's learning, which was emphasized in most of the researches we were studying, and we have to guide our teaching system towards it. Today's children are growing up in ICT world, and even if there was no academic education, they could learn knowledge toe to toe the students in their own



age. Traditional teaching systems are sometimes boring, and students need to use technology, which is most of the times is more encouraging to use technology more effectively we have to train teachers who are the executives and the families to make the infrastructures by using the technology in its right and proper way through the teaching system.

Computers has Surrounded the whole world and how wonderful it will be if we use them to teach or learn things, and specially language which can connect the whole world together. There are lots of problems that came to our life through computers and internet but still it is one of the most useful devices that brought us the opportunity of improving language learning system. Our children in future will learn as many language they want easier than people in the pas who wanted to learn just one language, and they do not even need to take classes, computer itself is enough to communicate and learn what they want.

Some of the concerns included in this article about teachers' professional development are shared by other researchers all over the world. One of them is that there should be more support from the government to provide language teachers with professional development programs that include courses that improve both teachers' communicative competence in the foreign language and training on the use of ICT. Moreover, these programs need to be on going for reasonable periods of time, so teachers can go beyond the "Where is the ON Button" stage (Schibeci et al., 2008)

References

- 1- Akyel, A. and Ercetin, G. (2009). Hypermedia reading strategies employed by advanced learners of English. *System*, 37(1), 136-52. <http://dx.doi.org/10.1016/j.system.2008.05.002>
- 2- Al-Jarf, R. S. (2005). The effects of online grammar instruction on low proficiency EFL college students' achievement. *The Asian EFL Journal Quarterly*, 7(4), 166-90.
- 3- Beatty, K., and Nunan, D. (2004). Computer-mediated collaborative learning. *System*, 32(2), 165-183. <http://dx.doi.org/10.1016/j.system.2003.11.006>
- 4- Chikamatsu, N. (2003). The effects of computer use on L2 Japanese writing. *Foreign Language Annals*, 36(1), 114-127. <http://dx.doi.org/10.1111/j.1944-9720.2003.tb01937.x>
- 5- Fitzpatrick A. & Davies G. (eds.) (2003) *The impact of Information and Communications Technologies on the teaching of foreign languages and on the role of teachers of foreign languages*, EC Directorate General of Education and Culture. Available here in PDF format: http://www.ict4lt.org/en/Fitzpatrick_and_Davies.pdf. The contribution by Graham Davies, relating specifically to the UK, is available in HTML format at http://www.camsoftpartners.co.uk/docs/ICC_Grahams_Report_Final.htm
- 6- Gelatt, H. B. (1995). Future sense: Creating the future. *The Futurist*, 3 (2), 35-43.
- 7- Herschbach, D. (1994). *Addressing vocational training and retaining through educational technology: Policy alternatives*. (Information Series No. 276). Columbus, OH: The National Center for Research in Vocational Education.
- 8- Hochart, J.J. (1998). Improving listening and speaking skills in English through the use of authoring systems. *ReCALL*, 10(2), 18-24. <http://dx.doi.org/10.1017/S0958344000003700>
- 9- Koohang, A. A. (1989). A study of the attitudes toward computers: anxiety, confidence, liking, and perception of usefulness. *Journal of Research on Computing in Education*, 22(2), 137-150.
- 10- Lee, L. (2002). Enhancing learners' communication skills through synchronous electronic interaction and task-based instruction. *Foreign Language Annals*, 35(1), 16-24. <http://dx.doi.org/10.1111/j.1944-9720.2002.tb01829.x>
- 11- Lee, S. T. (2008). *Teaching pronunciation of English using computer assisted learning software: An action research study in an institute of technology in Taiwan*. Unpublished Ph.D. dissertation. Australian Catholic University. Australia.



- 12- Mahfouz, S.M., and Ihmeideh, F.M. (2009). Attitudes of Jordanian university students towards using online chat discourse with native speakers of English for improving their language proficiency, *Computer Assisted Language Learning*, 22(3), 206-27.
- 13- McKenzie, J.(2005). Literacy and Semantic Power Plays . *The Educational Technology Journal*.. Vol14,5, June 2005.
- 14- McKnight, L. (2002) Dancers not Dinosaurs: English teachers in the electronic age EQ Australia Summer 2002.
- 15- Moseley, D. et al (1999) Ways forward with ICT: effective pedagogy using information and communications technology for literacy and numeracy in primary schools.
http://www.ncl.ac.uk/ecls/research/project_ttaict/ttaict2.htm (11/4/06)
- 16- Murphy, T. H., & Terry, R., Jr. (1998a). Adoption of CALL technologies in education: A national delphi. *Proceedings of the Forty-Fourth Annual Southern Agricultural Education Research Meeting*, 112-123.
- 17- Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computers & Education*, 37(2001), 163–178.
- 18- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: The Free Press.
- 19- Schibeci, R., MacCallum, J., Cumming-Potvin, W., Durrant, C., Kissane, B. y Miller, E. (2008). Teachers' journeys towards critical use of ICT. *Learning Media and Technology*, 33 (4), 313-327.
- 20- Tsou, W., Wang, W., and Li, H. (2002). How computers facilitate English foreign language learners acquire English abstract words. *Computers & Education*, 39(4), 415-428.
[http://dx.doi.org/10.1016/S0360-1315\(02\)00078-7](http://dx.doi.org/10.1016/S0360-1315(02)00078-7).
- 21- Zuboff, S. (1998). *In the age of the smart machine*. New York: Basic Books, Inc