Jordanian EFL students' perceptions of their computer literacy

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ABSTRACT

This study investigated 210 Jordanian EFL perceptions of their computer literacy. The findings revealed that the majority of the students reported being fairly proficient to proficient in computer skills such as deleting files (81.43%), copying files (78.57%), formatting a floppy disk (67.15%), and installing a program on a hard disk (64.29%), while most reported being not or a little proficient in computer skills such as using images from a camcorder or digital camera in computers (84.76%), using PowerPoint (80%), and creating databases (78.09%). The results further revealed no significant effect for gender but a significant effect for year of study on students' perceptions of their computer literacy.

Keywords: Jordan; computer-assisted language learning (CALL); computer-mediated communication (CMC)

INTRODUCTION AND BACKGROUND

Research on the effectiveness of computers in language teaching has been an ongoing process. Warschauer and Healey (1998) claim that that use of computers has changed drastically in the past thirty years from computer-fed drills to long-distance communication and collaboration in authentic research and multimedia publication. Warschauer and Healey (1998) divide the past four decades of computer-assisted language learning (henceforth, CALL) into three stages: behaviorist CALL which featured the drill-and-practice method based on the behaviorist learning model in which the computer was viewed as a mechanical, tireless tutor (Ahmad et al, 1985); communicative CALL which recognized language learning as a creative process of discovery, expression, and development; and integrative CALL which emphasized real language use in a meaningful and authentic context.

The use of computers in the classroom has proven advantageous in more than one respect. Not only has it been found to facilitate student learning (Goldman et al, 1999; Heinecke et al, 1999) but it has also been found to develop students' ability to learn independently, analyze information, think critically, and solve problems (Chavez, 1997). Kulik et al (1983) report significant increases in students' reading speed and comprehension across studies of computer-assisted reading instruction. Frizler (1995) claims that even though they will never replace teachers, computers can provide excellent and fairly inexpensive supplementary materials to enhance classroom instruction. Furthermore, computers have been found not only to promote visual, verbal and kinesthetic learning, higher-level thinking, and problem solving (Turnbull and Lawrence, 2002) but also to offer immediate feedback, hands-on learning, and collaborative instruction (Koller, 1996; Silva et al, 1996; González-Bueno, 1997; Chavez, 1997; Dahlgren, 1998; Drake, 1998; Schulz, 1999).

However, despite the potential benefits of using technology in the classroom, some teachers were found to shy away from using it effectively or at all, which may bring into focus the role of teacher training programs not only in helping teachers use technology effectively (Wenglinsky, 1998; Rowand, 2000) but also to change some of their practices and attitudes towards teaching and learning (Dwyer, 1990).

In a fairly recent book of case studies on computers in the classroom, Cuban (2001) examines issues of how computers are being used for instruction; how teaching and learning have changed as a result of steady increases in hardware and software in schools in the last two decades; and whether or not the investment in new technologies has been worth the cost. He (:179) claims that "computers have been oversold and underused, at least for now".

Sandholtz et al (1997) divide technology integration into five phases: entry, adoption, adaptation, appropriation, and invention. The entry stage is characterized by the teacher's use of text-based materials with traditional, teacher-centered instructional activities; the dominant instructional technologies at this stage include blackboards, textbooks, workbooks, and overhead projectors. At the adoption stage, at which traditional whole-group lecture and seatwork still dominate instructional strategies, instructional activities include keyboarding, word-processing, and drill-and-practice. At the adaptation stage, traditional instruction prevails, but some class time is allowed for students to use computers for homework and daily class work, while at the appropriation stage, teachers integrate technology regularly into the curriculum. Invention is characterized by the teachers' attempt to find new ways to connect students and use project-based and interdisciplinary approaches to instruction.

Cuban (2001:50) found that most pre- and elementary schools remained at the adoption level; that the use of computers was less important than cultivating social, civic, and academic values in children; and that traditional models of instruction were sustained rather than transformed. He also found that American university students usually use computers for word processing, to search the Internet, and for e-mail while professors use computers for their research rather than in the classroom. He further pointed out that lectures remain the dominant means of instructional delivery in American undergraduate classes, and that traditional methods of instruction have changed very little in the past few decades.

Even though computer-mediated communication (henceforth, CMC) in the foreign language classroom is a relatively young field, research suggests that CMC does have benefits over traditional teaching methods. Claims have been made about the dramatic effect of CMC on various communication processes (Hiltz and Turoff, 1978). Others claim that electronic communication provides more writing practice (DiMatteo, 1991), encourages co-operation between students (Barker and Kemp, 1990) and facilitates peer editing (Moran, 1991). Unlike face-to-face discussions, CMC has been found to facilitate more balanced student participation (Sproull and Kiesler, 1991).

Despite the benefits of using the computer in language teaching and learning, there has been a shortage in its use in the Jordanian classroom. However, over the last few years, Jordan has implemented educational reform measures to improve the quality of education, computerize schools, modernize curricula and teaching methods, enhance teaching-learning processes, and ensure equal access for the poor in regards to basic education (The Jordanian Ministry of Planning and International Cooperation, 2002).

Currently all secondary schools in Jordan have fully equipped computer labs, and asymmetric digital subscriber line (ADSL) connectivity has reached over 2010 of Jordan's 3000 public schools. The number of teachers trained on the International Computer driver's License (ICDL) was 43,000 in May 2004 and is expected to reach 60,000 by year end. Additionally, 65,000 personal computers (PCs) are currently installed in 2,250 public schools, bringing the ratio of student to PC from 43:1 in 2001 to 15:1 in 2004.

Through the Social and Economic Transformation Program (SETP), the Jordanian Government has engaged in the process of reforming and upgrading its higher education institutions through (i) computerizing universities; (ii) modernizing curricula; (iii) providing for better learning environments; (iv) encouraging research; (v) providing the institutional framework for improving the accreditation system; (vi) encouraging private sector investment; and (vii) monitoring the performance of higher education institutions.

Objectives of the study

Since the literature seems to support the notion that language teachers need to be computer literate, this study aims to investigate Jordanian EFL students perceptions of their computer literacy as a means to identify the kind of training Jordanian pre-service teachers may need to cope with the country's new trend towards information technology. In order to achieve the objectives of the study, the following research questions are addressed:

- How do the students perceive their level of computer literacy?

- What do the students perceive as the factors that limit their use of the computer?

- Are there significant differences in the students' use of the computer which can be attributed to the variables of gender and year of study?

Significance and limitations of the study

While some foreign research examines ESL students' attitudes and beliefs towards computer use (cf., for example, Brett, 1996; Davis and Lyman-Hager, 1997; Warschauer, 1996a and 1996b), very little research has been published about students' perceptions of their computer literacy, especially in third world countries.

In light of the several current computer-related educational reforms in Jordanian institutions of learning, the results of the present study are expected to provide valuable information to bridge the gap in the literature about computer use in the third world countries, represented here by Jordan. The present research is also hoped to establish grounds for further research in this area.

However, the generalizability of the findings may be limited due to the fact that the present study focuses solely on Jordanian EFL university students' perceptions of their computer literacy. The data do not confirm that the respondents are indeed as proficient as they perceive themselves to be.

RELATED LITERATURE

Despite the fact that the use of computers in the foreign language classroom is still a relatively young field, previous research suggests that it has advantages over traditional teaching methods.

Turnbull and Lawrence (2002) surveyed 88 Canadian 4th, 6th, 8th, 10th, and 12th grade students to find out their computer use at home and school, perceptions of the impact of computers on their learning, recommendations for frequency of computer use in foreign French classes, and problems with computers. About 87% of the students reported having a computer at home, 83% of students reported enjoying using computers, while the respondents reported a wide range of computer use at home with 77% for school projects, 68% for games, , 66% for the Internet, , 65% for e-mail, 55% for chat, and 53% for CD-Rom. Similarly, a wide range of computer use was

reported in foreign French classes with the Internet, word processing, and projects using technology topping the list with 80%, 63%, and 56%, respectively.

About 66% of the respondents reported a preference for project-based computer work in foreign French classes, while 47% reported liking Internet use, 15% software, and 14% word processing. About 70% of the respondents believed that they learned more when computers were part of their French classes, while 89%, 86%, and 84% reported feeling that computers facilitated their reading skills, writing skills, and vocabulary acquisition, respectively. An overwhelming 89% reported feeling that computers helped them learn better on their own.
In response to their problems with computers, 50% of the respondents reported problems related to Platform issues (Mac vs. PC), while smaller percentages reported technical problems (41%), writing on the computer in French (38%), lack of computers (34%), slow computers (28%), and teachers' inability to help (22%).

Cuban (2001) reports that surveys conducted at Stanford University in 1989 and 1997 indicated that the overhead projector and VCR were the two most frequently used machines in the classroom. The findings further revealed that computers, while used in the preparation for instruction, are very rarely utilized during the instructional process. Cuban (2001:132-133) has further found that (i) teachers are not technophobes; (ii) most teachers do not use computers during class time; (iii) most high school students do not have a "tech-heavy" experience; (iv) most teachers are not serious users of technology; (v) when computer use occurred, it was most often peripheral to instructional tasks; (vi) there is no concrete evidence of gains in academic achievement as the result of using computers; (vii) the majority of teachers using computers maintain existing practices of teaching; and (viii) few students used technologies at the invention level. Cuban also reported little to no use of computers in American foreign language classrooms.

Egbert et al (2002) examined how 20 English as a second language and foreign language teachers apply practical experiences from CALL coursework to their teaching and how teachers continue their CALL professional development. Their findings suggest that teachers who use CALL activities are often those who had prior experience with CALL; that lack of time, support, and resources prohibits the use of CALL activities while more time, more resources and better support enable CALL use; and that colleagues are the most common resource of new CALL activity ideas outside of formal coursework.

Some research has found that most teachers do not learn to use computers through coursework which seems to have little or no effect on pre-service teachers' beliefs about their abilities or use of what they have learned in their actual teaching practice. Langone et al (1998) found that although teachers do learn new skills as a result of instruction, they do not necessarily use those skills in their daily practice. Galloway (1997) found that most of his respondents reported using word processing most, while few reported using telecommunications, hypermedia, databases, or spreadsheets. Along the same lines, Smerdon et al (2000) reported that teachers use technology most frequently to prepare or supplement instruction rather than for purposes of instructional delivery.

Despite these findings, research suggests a correlation between changes in pre-service teachers' perceptions and classroom technology use. Pre-service teachers' confidence in computer use has been found to improve through formal teacher education coursework (Knezek et al, 1996) as do their attitudes towards computers (Lam, 2000). Grau (1996) reports that after a one-semester technology course, while a small percentage (22%) of the pre-service teachers equally perceived their computer skills as being above average or below average, 75% of these teachers reported using computers in their first year of teaching (mainly word processors and grade books). Smerdon et al (2000) also found that even more experienced teachers use the computer mainly

for word processing, spreadsheets, drills, and, to some extent, Internet research and problem-solving.

Abdal-Haqq (1995) argues that teachers are not integrating advanced technologies into their syllabi, possibly because teacher education in computers often focuses on "older and simpler instructional applications of computer technology" rather than multimedia, problem-solving applications, and other newer tools. A large body of research points to the pervasiveness of computer use for word processing (cf., for example, Levy, 1997; Strudler et al, 1999).
The literature points to a host of factors which may either support or prohibit the use of technology in the classroom use such as age, gender, attitudes toward technology, teaching experience (Lam, 2000), and the rate of technological change (Levy, 1997).

Facilitating factors range from pre-service use, perception of the usefulness of technology for teaching, and overcoming technology-related anxiety (Knezek et al, 1996). Peer collaboration in situated learning contexts seems to have an impact on teacher learning (Smerdon et al, 2000; Fisher, 1999). Instructional programs seem to play a key role in teachers' personal use and in their instructional delivery because technology is contextualized and teaching and learning take place simultaneously. Reed et al (1995) claim that as few as one computer course can positively affect teachers' attitudes toward computers. Fisher (1999) found that teachers' attitudes were strongly related to their success in using technology. Lam (2000) reported factors related to whether technology is useful for job performance and how easy it is to use. Yildirim (2000) reported the current uses of the technology in their schools and having a computer at home as factors which may influence teachers' computer use.

Obstacles include time pressures both outside and during class (Lam, 2000; Levy, 1997a; Reed et al, 1995; Smerdon et al, 2000; Strudler et al, 1995); lack of resources and materials (Loehr, 1996; Smerdon et al, 2000); insufficient or inflexible guidelines, standards, and curricula (Langone et al, 1998); lack of support or recognition for integrating computers (Grau 1996; Strudler et al, 1999); a clash between new technologies at universities and older ones in schools; lack of leadership (Smerdon et al, 2000); and inadequate training and technical support (Abdal-Haqq, 1995; Lam, 2000; Langone et al, 1998; Levy, 1997; Smerdon et al, 2000).

The majority of the research on the effect of gender on computer user's attitudes and literacy suggests that male users have more positive attitudes towards computers (Anderson, 1987; Nickell and Pinto, 1986; Comber et al, 1997) and a higher perceived computer knowledge than their female counterparts (Geissler and Horidge, 1993; Smith and Necessary, 1996).

SAMPLE, INSTRUMENTATION AND DATA COLLECTION

The population of the study consisted of all the EFL students at the Departments of Curriculum and Instruction and English at Yarmouk University in the second semester of the academic year 2003/2004. The sample of the study consisted of 210 (56 male and 154 female) EFL students, of whom 49 are freshmen, 50 sophomores, 40 juniors, and 71 seniors.
Based on their collective experience and a thorough review of the literature, the present researchers designed the research instrument and procedures. They designed a questionnaire after those of Porter (1997) and Mubireek (2001). The validity of the questionnaire was established by a jury of four EFL professors, three EFL supervisors, and five English language teachers whose comments were used to modify the questionnaire. The reliability of the questionnaire was established by piloting the study using test-retest on twenty-one EFL students who were excluded from the sample with a twenty-day interval between the two administrations of the questionnaire. Pearson correlation coefficient was calculated and found to equal 81.7%.

The questionnaire in its final form consisted of two demographic questions and 25 items which covered the students' perceptions of their computer literacy (19 items) and the factors limiting students' use of the computer (6 items including one open-ended question) (see the Appendix).

After establishing the validity and reliability of the questionnaire, a cover letter was written to the participants explaining the purposes of the study and assuring them of the confidentiality and anonymity of their responses. The questionnaire was distributed hand-to-hand to the participants. Of the 280 copies distributed, 210 copies were returned to the researchers, yielding a response rate of 75%.

FINDINGS AND DISCUSSION

Table 1 presents the numbers and percentages of the 19 questionnaire items pertaining to the first research question which addresses the level of the students' computer literacy.

Table 1 shows that 81.43% of the respondents report being either fairly proficient or proficient in deleting files. Similarly, 78.57% of the respondents report being fairly proficient or proficient in copying files, 67.15% in formatting a floppy disk , and 64.29 in installing a program on a hard disk. On the other hand, 85% of the respondents reported being a little or not proficient in using images from a camcorder or digital camera in computer applications, while various percentages of these respondents perceived themselves as being a little or not proficient in opening and using more than one file simultaneously (55.72%), searching a database system for specific information (58.57%), accessing information on a CD-ROM (59.05%), printing selected information from a database (62.86%), troubleshooting a malfunctioning printer (67.14%), using a database, spreadsheet or word processing software to create tables and figures (67.62%), using presentation software to create a lesson or a lecture (68.57%), using graphics software to create pictures (71.43%), creating a newsletter with desktop publishing (74.51%), creating a spreadsheet (75.72%), creating a database (78.09%), and using PowerPoint in the classroom (80%).

The findings reveal that the students are proficient to fairly proficient in lower-order computer skills but a little to not proficient in higher order computer skills, which may be attributed to the fact that their basic purposes for using the computer are oftentimes limited to word processing and electronic mail. Other higher-order skills are often foreign to these students, which may explain their perceptions of weakness in these skills.

Six questionnaire items (see the Appendix) were used to answer the second research question which investigates the factors the respondents perceive to limit their computer use. Table 2 below presents the frequencies and percentages of the respondents' answers.

Table 1: *Numbers and Percentages of the Students' Responses concerning their Computer Literacy*

Item No.	Item	Not Proficient		A Little Proficient		Fairly Proficient		Proficient	
		#	%	#	%	#	%	#	%
1	Use word processor to create and print a document	51	24.29	57	27.14	51	24.29	51	24.29
2	Format a floppy disk	24	11.43	45	21.43	48	22.86	93	44.29
3	Copy files	27	12.86	18	8.57	57	27.14	108	51.43
4	Delete files	18	8.57	21	10.00	69	32.86	102	48.57
5	Install a program on a hard disk	39	18.57	36	17.14	72	34.29	63	30.00
6	Access information on a CD-ROM	60	28.57	64	30.48	35	16.67	51	24.29
7	Search a database system for specific information	75	35.71	48	22.86	54	25.71	33	15.71
8	Print selected information from a database	69	32.86	63	30.00	33	15.71	45	21.43
9	Create a database (e.g., Paradox, Access)	112	53.33	52	24.76	35	16.67	11	5.24
10	Create a spreadsheet	108	51.43	51	24.29	21	10.00	30	14.29
11	Create a newsletter with desktop publishing	99	47.37	57	27.14	27	12.86	27	12.86
12	Use graphics software to create pictures	81	38.57	69	32.86	28	13.33	32	15.24
13	Use database, spreadsheet or word processing software to create tables and figures	99	47.14	43	20.48	37	17.62	30	14.29
14	Use a scanner to import graphics	62	29.52	45	21.43	61	29.05	42	20.00
15	Open and use more than one file simultaneously	69	32.86	48	22.86	54	25.71	39	18.57
16	Troubleshoot a malfunctioning printer	78	37.14	63	30.00	42	20.00	27	12.86
17	Use PowerPoint in the classroom	111	52.86	57	27.14	33	15.71	9	4.29
18	Use images from a camcorder or digital camera in computer applications	132	62.86	46	21.90	29	13.81	3	1.43
19	Use presentation software to create a lesson or a lecture	108	51.43	36	17.14	30	14.29	36	17.14

Table 2: Frequencies and percentages of the students' responses concerning the factors limiting their use of the computer

Item No.	Item	Missing	Never		Almost Never		Rarely		Occasionally		Frequently		Very Frequently	
			#	%	#	%	#	%	#	%	#	%	#	%
1	Time	45	36	21.82	41	24.85	27	12.86	55	26.19	6	3.64	0	0
2	Inadequate number of computers	38	6	3.49	17	9.88	11	6.40	43	25.00	56	32.56	39	22.67
3	Hardware problems	34	9	5.11	42	23.86	31	17.61	32	18.18	30	17.05	32	18.18
4	Lack of experience in computer use	38	27	15.70	35	20.35	48	27.91	51	29.65	5	2.91	6	3.49
5	Slow computers	43	21	12.57	33	19.76	53	31.74	42	25.15	12	7.19	6	3.59
6	Other	43	36	21.56	30	17.96	51	30.54	32	19.16	13	7.78	5	2.99

Table 2 shows that the two major factors which frequently or very frequently limit the students' use of the computer are the inadequate number of computers (55.23%) and hardware problems such as a malfunctioning disk drive, mouse, keyboard, or microphone (35.23%). Smaller percentages of respondents perceived slow computers (10.78%,), lack of experience in computer use (6.40%), and time (3.64) to pose serious limitations.

These findings may be attributed to the fact that the respondents' computer use is limited to basic functions such as word-processing and electronic mail, which may further explain why the respondents perceive inadequate numbers of computers and hardware problems as the major obstacles they face while other obstacles such as slow computers were not perceived as potentially serious. Routine computer functions do not require speed, specialized knowledge in computer use, or a lot of time to perform satisfactorily.

To answer the third research question, which is concerned with whether or not there are any significant differences in the students' computer literacy, Two-Way Analysis of Variance (ANOVA) test was used. The results are presented in Tables 3 and 4, below.

Table 3: Means and Standard Deviations of the Students' Perceptions of their Computer Literacy

Dependent Variable	Year	n	Mean	SD
Computer Literacy	1	49	23.89	14.21
	2	50	21.10	7.61
	3	40	24.25	10.28
	4	71	28.46	13.84

Table 4: ANOVA Statistics for the Effect of Gender and Year of Study on Students' Perceptions of their Computer Literacy

Source	DF	SS	MS	F-Value	Pr>F
Gender	1	293.61	293.61	2.14	0.1448
Year of Study	3	1931.71	643.91	4.70	0.0034**
Within Groups	204	27958.81			
Total	208	29957.52			

** Significant at α = 0.05

The findings do not reveal any significant effect of gender on the respondents' perceptions of their computer literacy ($F_{(1, 0.05)}$ = 2.14; P=0.1448). Although this result contradicts those of previous research (cf., for example, Anderson, 1987; Nickell and Pinto, 1986; Comber et al, 1997; Geissler and Horidge, 1993; Smith and Necessary, 1996), it may be explained in light of the fact that both male and female students at Yarmouk University study the same courses under the same conditions.

However, the results of the Two-Way Analysis of Variance (ANOVA) between groups design reveal a significant effect for the variable of the year of study on the students' mean scores in computer literacy ($F_{(3, 0.05)}$ = 4.70; P=0.0034).

Table 5 presents the findings of the multi-comparisons of the students' responses according to the variable of year of study.

Table 5: Tukey Test of Multi-Comparisons of Students' Perceptions of their Computer Literacy according to Years of Study

Years	Mean Difference	95% Confidence Interval
1 2	1.79	- 3.38 8.96
1 3	-0.36	- 6.88 6.17
1 4	-4.58	-10.27 1.11
2 3	-3.15	-9.58 3.28
2 4	-7.38	-12.96 -1.79**
3 4	-4.22	-10.20 1.76

** Significant at α = 0.05

As shown in Table 5, Tukey test of multi-comparisons reveals a significant difference between the mean scores of second and fourth year students in favor of fourth year students in computer literacy. Fourth year students were found to perceive themselves as more proficient in using the computer than their second year counterparts although the findings do not reveal any significant differences among the other years of study in computer literacy.

This curious result may be attributed to the fact that computer use is more prevalent among more advanced students than those in their early years of study. It may be the case that first-year students are not aware of their computer proficiency simply because they have not yet been given opportunities to put it to the test. Due to exposure to computer use, possibly for the first time, second year students are made aware of their limitations in computer literacy, a problem which may diminish with time and increasing exposure best available to fourth-year students.

IMPLICATIONS AND RECOMMENDATIONS

A lot of research has been conducted on the effect of computer use on various aspects of the educational process. However, although the literature emphasizes the strong relationship between users' proficiency in and attitudes towards using the computer, it has little research on the users' perceptions of their computer literacy and the obstacles that face them, especially in third world countries. The present researchers urge scholars to conduct further research on students and teachers' need for and attitudes towards computer use for educational purposes, on the effect of computer use on teaching/learning the various skills, on contextualizing/ providing a cultural context for foreign language learning, on promoting learner autonomy and independent learning, and on developing students' critical thinking and problem-solving abilities within the Jordanian and Arab World context to bridge the gap in the current literature.

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APPENDIX

The Questionnaire

Demographic Information

Year of Study
First year
Second year
Third year
Fourth year
Gender
Male
Female

Please place a (√) in the column that corresponds to your level of proficiency for each of the following skills.

How proficient are you in the following skills?

No.	Skill	Not Proficient	A Little Proficient	Fairly Proficient	Proficient
1	**Use a word processor to create and print a document**				
2.	**Format a floppy disk**				
3.	**Copy files**				
4.	**Delete files**				
5.	**Install a program on a hard disk**				
6.	**Access information on a CD-ROM**				
7.	**Search a database system for specific information**				
8.	**Print selected information form a database**				
9.	**Create a database (e.g., Paradox, Access)**				
10.	**Create a spreadsheet**				
11	**Create a newsletter with desktop publishing**				
12.	**Use graphics software to create pictures**				
13.	**Use a database, spreadsheet or word processing software to create tables and figures**				
14.	**Use a scanner to import graphics**				
15.	**Troubleshoot a malfunctioning computer**				
16.	**Open and use more than one file simultaneously**				
17.	**Use PowerPoint in the classroom**				
18.	**Use images from a camcorder or digital camera in computer applications**				
19.	**Use presentation software to create a lesson or a lecture**				

Part 2: Difficulties Limiting Students' use of the computer

How frequently do the following cause you problems in using the computer?

No.	Item	Never	Almost Never	Rarely	Occasionally	Frequently	Very Frequently
1	**Time**						
2.	**Inadequate number of computers**						
3.	**Hardware problems**						
4.	**Lack of experience in computer use**						
5.	**Slow computers**						

6. Other (mention, please!)

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