

COMPUTER LITERACY IN LEARNING ACADEMIC ENGLISH: IRANIAN EAP STUDENTS' AND INSTRUCTORS' ATTITUDES AND PERSPECTIVES

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Abstract

This study aimed to analyze perceptions of Iranian English for Academic Purposes (EAP) students on their computer literacy levels. A total of 641 undergraduate students of civil engineering and 34 EAP instructors participated in the study. Data collection instruments included questionnaires and semi-structured interviews. Findings confirmed that the participants perceived Iranian EAP students' computer literacy levels as low and insufficient for the efficient implementation of Computer-Assisted Language Learning (CALL) in EAP instruction. The results of the study highlighted that computer literacy occupies a significant role in tertiary students' academic and EAP achievement. It appeared that there are several constraints and barriers which would discourage EAP students from promoting their computer literacy and using computers for learning EAP. Furthermore, the study found evidence to support the view that there should be adequate computer literacy training programs for EAP students to facilitate the incorporation of computer technology in EAP instruction. The analysis of qualitative data provided insights into participants' perceptions of several specific computer-based skills required for technology-enhanced EAP learning. Implications for the integration of technology and CALL in EAP instruction are provided.

Keywords: EAP learning; computer literacy; civil engineering; technology; training

1. Introduction

Technological developments and the merits of CALL have obviously influenced EAP instruction similar to other educational fields. In EAP instruction students should acquire the necessary academic and technological skills to be identified as competent members of different academic communities (Jarvis, 2009). The use of technology in EAP instruction has been regarded as effective and necessary. Technology would offer implications for materials development, needs analysis and methodology of EAP instruction. For instance, the advent of the Internet has given EAP instructors several choices regarding their materials development. More specifically, EAP instructors can make use of multimedia applications and Web-based resources to develop specific and discipline-specific materials for their instruction.

Technology has encouraged us to redefine some key terms and concepts used in EAP instruction. These concepts include specificity, authenticity, cost-effectiveness, and needs (Arno, 2012).

Computer literacy plays an important role in EAP students' academic achievement. Jarvis & Pastuszka (2008) stress that EAP learners need to be academically competent and proficient to be able to operate efficiently in academic contexts. Nowadays, EAP students are expected to be electronically competent and be able to operate effectively in electronic contexts as well. This shows that electronic literacy should be included in the definition of academic literacy to give it a more comprehensive meaning and a broader sense. White (2003) further states that EAP learners also need a lot of support and training regarding their computer literacy if technology is going to be integrated into EAP instruction. Arno (2012) also stresses the fact that there have been a plethora of technological breakthroughs and changes recently, therefore, EAP students should be equipped with the necessary technological, communication, and critical skills to study and operate in international and academic environments. Similarly, Jarvis (2009) points to the problem of e-literacy for EAP students when he mentions the challenges of computer-assisted EAP instruction. "The notion of equipping learners for academic study raises specific challenges of e-literacy for non-native speakers of English and it is by no means clear whether EAP providers are rising to this challenge" (Jarvis, 2009, p.57). Jarvis (2009) further recommends including Information and Communication Technology (ICT) study skills for EAP students.

As for the importance of the integration of technology in EAP instruction, Jarvis and Pastuszka (2008) suggest that there is a close link between EAP and CALL. To argue the significance of the implementation of CALL in EAP instruction, Jarvis (2005) suggests that a wide range of electronic and computer-based materials are used in university courses, higher education and EAP instruction. Moreover, in EAP courses students should be able to read authentic academic materials. Computer-based and online resources are commonly rich regarding their authenticity (Plastina, 2003). Jarvis (2009) suggests that the two main areas should be touched upon if computers are to be integrated into EAP instruction, namely preparing EAP learners for their academic purposes and facilitating language learning.

In the recent years, developments in the field of educational technology and CALL have influenced EAP instruction considerably (Arno, 2012; Jarvis, 2009; Plastina, 2003). As a result, in EAP contexts, students should acquire the necessary academic and digital literacy to be identified as competent members of their academic discourse communities (Jarvis, 2009). The integration of technology into EAP instruction provides tremendous opportunities for

instructors and learners to improve the quality of instruction and learning. Specifically, technology offers implications for materials development, needs analysis, and methodology of EAP instruction. The Internet, together with online language learning tools and applications, can empower EAP instructors and materials developers to produce authentic and up-dated materials related to students' needs and preferences (Plastina, 2003). In addition, EAP instructors can make use of multimedia applications and Web-based resources to develop authentic and discipline-specific materials for EAP instruction. Technology has encouraged us to redefine key terms and concepts of EAP instruction, including authenticity, cost-effectiveness, and needs (Arno, 2012).

Out of all definitions proposed for computer literacy, the one provided by Son, Robb, and Charismiadji (2011) was adopted for the purposes of this study. They define computer literacy as "the ability to use computers at an adequate level for creation, communication and collaboration in a literate society" (p. 26). This definition was adopted for two reasons. First, this definition is one of the most recent and comprehensive definitions which was presented for computer literacy. Second, the emphasis on the concept of the "literate society" might be closely relevant to the characteristics of EAP instruction. In EAP contexts, students should be socialized into academic communities, which are specialized types of literate societies (Hyland, 2006).

Flowerdew and Peacock (2001, p. 8) define EAP as "the teaching of English with the specific aim of helping learners to study, conduct research or teach in that language". Moreover, EAP courses are based on the needs, learning styles and preferences of students. These courses are based on the principles of learner-centered approaches to education (Hutchinson & Waters, 1987; Hyland, 2006).

2. Background to the study

To date, several research studies have been undertaken on EFL/EAP students' perceptions of their computer literacy. For instance, Bataineh and Baniabdelrahman (2006) investigated Jordanian EFL students' perceptions of their computer literacy employing a survey study. Students reported that they were incompetent in more advanced computer skills, while they were competent in basic computer skills. No significant effect was found for gender, but a significant effect was actually observed for the year of study regarding students' perceptions of their computer literacy. In a qualitative-quantitative study using questionnaires and interviews, Dashtestani (2015) explored computer literacy, self-efficacy and attitudes of 120 Iranian EAP students of four different disciplines (i.e., biology, political sciences, psychology,

and law) towards Web-based assessment of academic vocabulary. A Web-based test of academic vocabulary was administered to students. The findings revealed that the EAP students had positive attitudes toward the Web-based test and enjoyed high levels of self-efficacy in using computers. Kiliç-Çakmak (2010) examined learning strategies and motivational factors predicting information literacy and self-efficacy of e-learning students. She argued that meta-cognitive, effort management, elaboration and critical thinking strategies, as well as belief control strategies predict different aspects of information literacy self-efficacy.

In Japan, Murray and Blyth (2011) analyzed perceptions of 103 university students of their computer literacy levels. They reported that the students lacked competence in using several computer applications, including word-processing, spreadsheets and presentation software tools. They pointed out that the participants lacked knowledge of communication, computers, the Internet and software tools. Similarly, Lockley (2011) assessed perceptions of 105 Japanese students on using ICT. He found that the Japanese students lacked competence in most aspects of ICT, whereas they frequently used computers and the Internet at home and received instruction at schools. He concludes that students learn how to use some software tools at high schools, while they do not need to use them in actual situations.

Verezub, Grossi, Howard and Watkin (2008) undertook a study on building electronic literacy for vocational education and student training. They pointed out that training to apply meta-cognitive strategies enhanced comprehension in the hypertext context. Chen (2006) conducted a case study on the development of email literacy. Using a critical discourse analysis approach, he identified the complexity of an L2 learner's evolving e-mail practice and attempt for appropriateness, particularly in the participants' e-mail communications with professors. Simpson (2005) evaluated the learning of certain skills associated with electronic literacy, namely discourse management and technological skills involved in using synchronous computer-mediated communication (SCMC).

To summarize, previous research has shown that computer literacy and its development are complicated issues. In addition, most students lack adequate levels of computer literacy, which are required for educational purposes. Computer literacy appears to differ from context to context. The findings of previous research on computer literacy imply that the majority of students need training for the efficient use of computers and technology for educational purposes.

3. The study

3.1. The rationale for conducting this study

Plastina (2003) expresses her concern over the fact that limited attention has been directed towards the link between CALL and EAP in the previous literature of language learning. This concern might be best manifested when she asserts that “research relating CALL to General English issues has been carried out, but little attention has been paid to the use of computers in EAP. EAP practitioners have principally grounded their research in the fields of academic writing, academic reading and academic assessment without much noteworthy research on EAP related to CALL” (Plastina, 2003, p.16). Jarvis and Pastuszka (2008) also emphasize that information technology offers several implications and applications for EAP instruction. Concerning the use of computers in EAP contexts, Warschauer (2002) maintains that computers and computer-mediated communication (CMC) would improve interactions at different levels. These interactions among different EAP students and a broader academic community will help learners to be socialized into their academic discourse communities. More importantly, as Plastina (2003) points out, the sociolinguistic and social constructivist view to EAP is in accordance with the principles of integrative CALL (Warschauer & Healey, 1998). Therefore, both approaches emphasize “the value of integrating language skills and technology to combine authentic language, learner autonomy with information processing and communication” (Plastina, 2003, P. 17).

To date, several empirical research studies have been published regarding the issue of computer literacy in the field of EAP instruction. Similarly, some research has been conducted on the use of technology in EAP instruction. Many of the claims about the use of technology in EAP instruction should be backed up by sound empirical evidence. Therefore, this study enriches the literature on the implementation of CALL in EAP instruction. Moreover, the findings will have implications for all stakeholders of EAP, especially on how to gear courses to different types of technological needs, proficiencies and preferences of EAP students. EAP course designers would be able to have a profile of technological needs, perceptions, proficiencies and lacks of EAP students based on which they will be able to design efficient and effective EAP courses systematically. To achieve these aims, the discipline of engineering was selected in this study since some emphasis has been previously placed on the integration of computer technology courses into engineering curricula (Lawal, Adegbemile, Aribisala, & Oke, 2008). It is also stated that engineering stakeholders should be electronically literate

(Lawal et al., 2008). Finally, civil engineering is one of those majors about which limited research has been conducted in the EAP literature.

These assumptions led to the formulation of the research questions of this study as follows:

1. What are the perceptions of EAP students and EAP instructors of civil engineering about EAP students' computer literacy levels?
2. What are the perceptions of EAP students and EAP instructors of civil engineering of the necessary computer-based literacy skills required for EAP learning?
3. What are the attitudes of EAP students and EAP instructors of civil engineering toward the role of computer literacy in students' academic and EAP success?
4. What are the perceptions of EAP students and EAP instructors of civil engineering of the challenges and barriers that limit students' computer literacy?

3.2. Research design

This study was designed based on a survey in support of a qualitative paradigm. Questionnaires were administered to EAP undergraduates and qualitative data were collected employing in-depth semi-structured interviews with EAP undergraduates and instructors. Surveys are commonly used in EAP needs analysis studies. The rationale for using a survey was that the results of surveys can provide useful profiles of information about EAP students' needs and the data will facilitate EAP curriculum development and course designing practices in the future (Jordan, 1997).

3.3. Instruments and data analysis

3.3.1. Questionnaire

To answer the research questions, a questionnaire on student computer literacy was designed. In EAP research methodology, questionnaires can provide valuable information on EAP students' needs, perceptions and attitudes (Jordan, 1997). The design of the questionnaire was backed up by the extensive review of the literature linked to computer literacy and the use of technology in EAP instruction (e.g., Arno, 2012; Bataineh & Baniabdelrahman, 2006; Corbel & Gruba, 2004; Godwin-Jones, 2000; Jarvis, 2009; Warschauer & Liaw, 2010) as well as the feedback received from several EAP students and instructors prior to the conduction of the study.

The six sections of the survey were as follows: Section I (demographic information); Section II (students' perceptions of their computer literacy, 25 items); Section III (factors that limit students' computer literacy, 7 items); Section IV (attitudes toward computer literacy, 2 items); Section V (having a course on computer literacy training, 1 item); Section VI (open-ended items, 3 items). In total, the questionnaire comprised 38 items with a four-point Likert scale format.

Considering the internal consistency and reliability of the questionnaire, a satisfactory range of Cronbach's Alpha reliability coefficient was achieved ($\alpha=0.87-0.91$), which was appropriate for the purposes of this study. In addition, the content of the questionnaire was validated by a jury of seven senior university professors of EAP, civil engineering and computer sciences. After several sessions of evaluating the items of the questionnaire, certain items were deleted and the content of the questionnaire was improved.

The Persian versions of the questionnaire were distributed among the EAP students and the questionnaires were completed in class. With regard to the objectives of the study, a descriptive analysis was performed to analyze the perceptions of the participants reflected in the quantitative data with the statistical analysis computer package SPSS 16. The mean and standard deviation analyses were used while describing the data. The descriptive procedure of data analysis was used for the results of the questionnaires since this data analysis procedure yields valuable information about the nature of a particular group of individuals (Best & Kahn, 2006).

3.3.2. Semi-structured interview

In EAP research methodology, interviews provide researchers with rich information on students' skills, attitudes and expectations. The triangulated use of interviews and questionnaires to enrich the data is recommended by EAP experts (Jordan, 1997).

Accordingly, to obtain in-depth insights into EAP students' and instructors' perceptions, interviews were conducted. Several aspects and issues related to the focus of the study were taken into consideration in the development of the questions of the interviews. The interview questions were based on the focus of the study and the literature reviewed in the survey phase of the study (i.e., the levels of computer literacy of EAP students, the limitations of using computers in EAP courses, the role of computer literacy in students' EAP and academic success, necessary computer literacy skills required for EAP courses and the need for a training course on computer literacy for EAP students). To compare participants'

perceptions, the EAP students and instructors were asked the same questions. Open-ended questions were used to explore the perceptions of the participants. The questions of the interview were validated by the jury of seven EAP, civil engineering and computer instructors. The questions of the students' interview were as follows:

1. What do you think about your computer literacy level?
2. What factors might limit your use of computers for EAP learning?
3. What is the role of computer literacy in your EAP success?
4. What is the role of computer literacy in your academic success?
5. What is your opinion on including a computer literacy course in the university curriculum?
6. What do you think are the necessary computer literacy skills that EAP learners should learn/know?

The EAP students who participated in the interviews were those who had taken part in the questionnaire phase of the study. The purposes of the study were explained to them and the participants took part in the interview phase of the study voluntarily. The purposes of the study were also explained to the EAP instructors prior to their voluntary participation in the interviews. To analyze the qualitative data, content analysis was applied to the results of the interviews. Content analysis is appropriate for the semi-structured data analysis since it produces in-depth descriptions on the participants' statements of their views and perceptions (Denzin & Lincoln, 2000). The interviews were audio-taped, transcribed and translated into English. The interview data were read line by line by two coders. After ensuring coding consistency, the emerging themes were examined and reported. Also, excerpts from participants' statements were included.

3.4. Participants

Out of all 700 questionnaires administered to the EAP students of civil engineering from seven Iranian universities, 641 completed questionnaires were returned. Both males (561) and females (80), whose ages ranged 20-26, were included in the sample group. All participants took part in the study voluntarily. The distribution of students from each university has been shown in Table 1. For anonymity reasons, the names of universities are shown in Roman numerals. Both public and non-public universities were included in the study. Due to adequacy of time and access, cluster sampling was used to ensure the generalizability of the results (Long, 2005). Also, 34 EAP instructors participated in this study. The interview participants took part in the interview phase of the study to provide qualitative and

supplementary data. They were MA holders (76%) and PhD holders (24%) of Applied Linguistics or English Literature. They had the average years of teaching experience of 9.73 (Table 2). They were selected from the universities from which the EAP students were selected.

Table 1. Distribution of EAP students who took part in the questionnaire survey

University	Undergraduates of civil engineering (Frequency)	Percentage
University I	N=106	16.5%
University II	N= 98	15.3%
University III	N=111	17.3%
University IV	N=88	13.7%
University V	N= 96	15%
University VI	N=79	12.3%
University VII	N=63	9.8%

Table 2. Participants of questionnaire and interview phases of the study

Questionnaire study	EAP students (N=641)	
Interview study	EAP students (N=100)	EAP instructors (N=34)

3.5. Results

3.5.1. Participants' perceptions of EAP students' levels of computer literacy

Questionnaire results

The total mean of the section related to students' perceptions of their computer literacy equals 2.3, which shows that the EAP students perceived themselves as *a little proficient* or *fairly proficient* in the use of computers in general (Table 3). A comparison of the means shows that the EAP students perceived themselves as *fairly proficient* or *proficient* in computer literacy skills such as formatting drives, copying files, deleting files, writing a compact disk, accessing information on a CD-ROM, installing programs on a hard disk, using the Internet, sending and receiving e-mails, printing selected information from a data base, using a word processor to create documents, typing skills and using a scanner to import graphics. The EAP students further perceived that they lacked proficiency or had limited proficiency in some computer skills, including using PowerPoint for educational purposes, using the computer in

academic researching, fixing common software problems, fixing common hardware problems, using suitable search engines, installing operating systems, creating a spreadsheet, creating a database, programming skills, creating and maintaining a basic weblog, digital image manipulation, using a wiki, and using RSS feeds to store and retrieve information.

Table 3. Perceptions of EAP students of their levels of computer literacy

Scales						
N=641	1. Not proficient	2. A little proficient	3. Fairly proficient	4. Proficient	Mean	SD
Copying files					3.6	0.71
Deleting files					3.59	0.74
Installing a program on a hard disk					3.03	1.04
Installing operating systems					2.17	0.97
Accessing information on a CD-ROM					3.54	0.73
Formatting drives					3.67	0.72
Writing a compact disk					3.4	0.84
Using a scanner to import graphics					2.55	1.66
Printing selected information from a database					2.64	1.07
Fixing common hardware problems					1.62	0.84
Fixing common software problems					1.95	1
Using PowerPoint for educational purposes					1.5	0.85
Using a word processor to create documents					2.83	1.02
Programming skills					1.34	0.64
Typing skills					2.69	1.08
Digital image manipulation					1.92	1.05
Creating a spreadsheet					1.88	0.92
Creating a database					1.62	0.83
Using the computer in academic researching					2.14	0.97
Using the Internet					2.86	1.05
Sending and receiving emails					2.69	1.08
Using suitable search engines					2.13	1.09
Creating and maintaining a basic weblog					1.28	0.60
Using a wiki					2.04	0.98
Using RSS feeds to store and retrieve information					1.78	0.97

Interview results

In the interviews, many EAP students stated that their levels of computer literacy were low. They asserted that they mostly use computers for non-academic purposes. The EAP students

reported that they lacked English proficiency. More importantly, the EAP students mentioned that they needed to know and learn more about the use of computers in their EAP courses.

Well, I don't think that I know much about computers. I just know how to perform some simple and routine applications such as word processing, the Internet, e-mailing, and multi-media applications (Student 4).

Actually, we have not attended any courses regarding the uses of computers in our academic studies including EAP. I suppose my current computer literacy level is responsive to my current activities which are not academic ones. For academic purposes, I think I should have some computer literacy training (Student 14).

My academic and general English proficiency are not that high. Because of this I am not able to use the Internet-based academic information efficiently. I think I have to improve my English and computer literacy at the same time (Student 47).

Most of us, I mean the students of civil engineering have learned our computer literacy skills by ourselves in our homes and not in academic contexts. When we enter the academic arena, we are required to have high levels of computer literacy and English competence while we are not ready for them (Student 85).

Computers are changing every day and moment. New applications, software, hardware and other innovations are appearing and I think I have to update my knowledge of these new technologies. I think I am not competent in using computers concerning working with new technologies and applications (Student 54).

The EAP instructors stated that the EAP students need to improve their general and academic English proficiency because these two types of proficiency are interacting with computer literacy levels. They also perceived that students are not proficient enough in most computer literacy skills.

EAP students lack different sorts of proficiencies. General and academic English proficiencies are important ones. Also, they lack computer literacy skills which are important for both academic and EAP fields in engineering courses (Instructor 12).

I believe EAP students need to be more competent in using computers. They might be competent to use computers in non-academic contexts, but what about academic contexts which are more demanding and complicated? (Instructor 3).

3.5.2. Participants' perceptions of factors that limit EAP students' computer literacy levels

Questionnaire results

Examining the mean scores presented in Table 4 depicts that some challenges, including the lack of computers at universities, slow computers at universities, the lack of competence in appropriate use of computers, and the lack of motivation to use computers, are perceived as

important or *very important* by EAP students. On the contrary, the lack of time, hardware problems, and the high cost of using computers are perceived as *unimportant* or *somewhat important* factors which restrict the use of computers in EAP courses.

Table 4. Perceptions of EAP students of factors that limit students' computer literacy

Scales						
N=641	1. Not proficient	2. A little proficient	3. Fairly proficient	4. Proficient	Mean	SD
The lack of time					2.1	0.94
The lack of computers at universities					3.19	0.79
Hardware problems					2.2	1.11
Slow computers at universities					2.98	0.99
The lack of competence in appropriate use of computers					2.67	1.13
Not being motivated to use computers					2.84	1.02
High cost of using computers					1.84	0.88

Interview results

Many EAP students and instructors stressed that there was a lack of computers at universities. Slow Internet connections, absence of computer-based training, the lack of financial support, ineffective EAP instruction methodologies and students' low computer competence were the other major constraints pointed out by the participants.

There's a clear the lack of computer-based facilities at universities. There are not enough computers for the use of all students. Most of computers available are old and slow (Student 27).

University authorities should support instructors to include computers in their EAP courses. We need to improve our technological equipment at universities and also encourage students to use computers for their academic studies by some awareness-raising measures maybe (Instructor 8).

The current EAP curriculum is not responsive to the integration of computers and technology. It's my belief that we should improve the current curriculum so that technology can be integrated into it efficiently (Instructor 22).

3.5.3. Participants' attitudes toward the role of computer literacy in EAP students' academic and EAP success

Questionnaire results

The majority of EAP students perceived the role of computer literacy in their academic and EAP success as *very important* or *important* (Table 5). The EAP students further *strongly agreed* on having a course on developing their computer literacy (Table 6).

Table 5. Attitudes of EAP students toward the role of computer literacy in their academic and EAP success

Scales						
N=641	1. Not proficient	2. A little proficient	3. Fairly proficient	4. Proficient	Mean	SD
Role of computer literacy in EAP students' academic success					3.66	0.66
Role of computer literacy in students' EAP success					3.46	0.79

Table 6. Attitudes of EAP students toward having a course on developing computer literacy

Scales						
N=641	1. Not proficient	2. A little proficient	3. Fairly proficient	4. Proficient	Mean	SD
Having a course on developing computer literacy					3.73	0.6

Interview results

Both EAP instructors and EAP students stated that computer literacy is a very important factor in EAP students' success in the field of EAP learning and their academic courses. The EAP instructors believed that computer literacy, academic literacy and Academic English proficiency depend on each other closely. The EAP instructors believed that we should try to improve these literacies at the same time in EAP instruction. Many EAP students also believed that the importance of computer literacy is not limited to EAP courses. They argued that computer literacy is important to all the subjects which are relevant to their field of study.

Computer literacy is very important for the students of civil engineering. We should be able to use different software and applications in our major (Student 73).

This is a fact that computer literacy is an important element of success in academic contexts. EAP courses are not exceptions in this regard (Student 61).

It's obvious that those students who are more competent in using computers, especially the Internet can be more up-dated and knowledgeable than others regarding the changes that occur in their disciplines (Instructor 30).

My opinion is that there is a relationship among different sorts of proficiencies. Thus, success in academic milieus depends on improving all of these proficiencies and it's clear that computer literacy is one of those necessary ones (Instructor 18).

Also, most EAP students deemed that having a course or a program which promotes their levels of computer literacy can be beneficial. The EAP instructors also agreed that students should have a course or program on improving their computer literacy. They asserted that in

addition to providing students with the relevant types of training, students need to be aware of and encouraged to include computers and technology in their educational practices. Students should be trained to use computers for their academic purposes.

Yes, it's a good idea to have some course-specific training on our computer literacy. Though, the course should be a specialized one which will help us to know new things about computers (Student 40).

The course would benefit EAP students a lot (Student 88).

The idea of training courses is good provided that they are designed based on students' specific needs. What is more effective, in my view, is continuous awareness-raising programs on the issue of computer literacy. I believe this would have a more permanent effect (Instructor 1).

3.5.4. Participants' perceptions of computer-based literacy skills necessary for EAP courses

Interview results

The EAP instructors and students admitted that all students should be competent in various computer skills. The majority of participants perceived using online English dictionaries, using various search engines, developing advanced word-processing skills, exchanging academic emails in English, participating in English academic forums, reading and using academic cyber-genres and using computers in conducting academic research as important computer-based needs of EAP students. The EAP students reported that they need to know how to locate academic information on the Internet.

We need to find some texts related to our major in English on the Internet. I also guess that we should write academic articles in English, especially in our MS courses. Typing in English is also very important for students of civil engineering (Student 28).

Searching for locating English academic information is very important for us. Wikipedia also provides us with a lot of good information, but the problem is that we have to use the Persian version of Wikipedia and the information which has been translated into Persian is not complete and valid. We need to be able to read the English information on Wikipedia (Student 3).

Being able to use different kinds of search engines is very important. I think most of us Google and no other search engines. We need to know how to work with other search engines too (Student 66).

In my view, students of civil engineering should be competent enough to distinguish what kind of online English information is valid and what information is invalid (Student 58).

EAP students are supposed to be able to use different computer applications and also the Internet competently and critically. They need advanced levels of computer skills (Instructor 19).

4. Discussion

The analysis of the quantitative and qualitative data indicated that the EAP students' levels of computer literacy are generally low. More importantly, the EAP students' seem to be incompetent in computer skills which are relevant to EAP learning. For instance, the use of wikis is deemed to promote autonomous and collaborative learning among EAP students (Felea & Stanca, 2010), while the findings of this study revealed that most Iranian EAP students were not competent to use wikis for their EAP learning effectively. Another computer skill which is relevant to EAP learning is the use of computers and the Internet for conducting academic research (Kasper, 2000). EAP students can further benefit from making use of and creating electronic genres such as blogs and databases (Toledo, 2006). Contrary to these expectations, the EAP students who participated in this study perceived themselves incompetent in using and creating blogs and databases for academic purposes. The competence to design and make PowerPoint presentations in English for Academic Purposes is yet another computer skill that can offer several merits for the students of EAP (Dashtestani, 2013). However, the EAP students who participated in this study perceived that they had a low level of proficiency of using PowerPoint for their academic purposes. A further computer literacy skill which can help EAP students to learn academic English is searching and organizing information via search engines. It is crucial that EAP students become able to evaluate the quality of academic information on the Internet (Jarvis, 2001). The findings showed that the EAP students showed a low level of competence to use search engines for their academic purposes. Arno (2012) points out that there is a close connection between the use of Web 2.0 applications and EAP learning. Web 2.0 applications can help EAP students be members of discourse communities, be exposed to various genres and receive authentic input. Creating and using websites are necessary skills that might contribute to EAP learning (Jarvis, 2004). Apparently, EAP students should be trained and instructed in how to use computer applications related to EAP learning appropriately and effectively.

Both instructors and students pointed out the significance of promoting students' computer literacy for EAP and academic learning. This implies that EAP authorities and providers should devote close attention to the issue of computer literacy and the ways of promoting EAP students' computer literacy levels. The participants expressed their positive attitudes toward the inclusion of training courses and programs to develop students' computer competence levels. This demand was put forward in other studies accordingly. Huckin (2007) suggests that electronic and online genres are new types of genres and students should be trained to read and produce these specialized types of genres. Jarvis (2009) calls for the

integration of computer literacy courses in EAP curricula. When EAP students learn about technology, they can take advantage of the considerable opportunities to learn academic discourse. The results would suggest that computer literacy plays a considerable role in university students' EAP and academic achievement. This finding is congruent with the previous studies which suggested that the issues of computer literacy and academic success of university students are closely interrelated (Hyland & Hamp-Lyons, 2002; Warschauer, 2002). Arno & Rueda (2011) posit that EAP students of engineering show interest in the use and integration of technology in their EAP courses. They argue that technology should be integrated into engineering curricula since technology can offer engineering students a plethora of learning opportunities.

The results provided valuable information on several technology-based skills that the participants deemed as necessary and beneficial to be included in EAP instruction and learning. These computer literacy skills are similar to the computer skills suggested by Jarvis (2004) for students in EAP contexts, including using the Internet, writing and sending emails, word processing, using PowerPoint, creating websites and using multimedia. Accordingly, using online applications were perceived to be effective for EAP learning. Plastina (2003) argues that the Internet would be an appropriate resource for socializing EAP students into academic communities. Arno (2012) asserts that technology, especially the Internet, would provide EAP students with adequate discipline-specific materials and resources. Hyland (2006) highlights the importance of exploring the specific needs of EAP students in EAP courses and meeting these needs in language instruction.

Furthermore, there are several obstacles that might discourage EAP students from using computers for their academic and EAP practices. Pragmatic constraints, such as slow computers and the lack of computers at universities, are serious concerns that need to be considered and heeded by educational providers. Identifying and removing these shortcomings in EAP courses are essential measures that should be taken immediately and reasonably (Hutchinson & Waters, 1987). If these impeding factors are not identified and accommodated, they may influence the attitudes of teachers and students toward technology in the future (Dashtestani, 2012).

Another significant impediment might be related to EAP students' low levels of motivation to use computers. The interdependence of EAP students' motivation and realization of their needs should not be overlooked in this regard. The use of technology will foster EAP students' both motivation and autonomy (Arno, 2012). The lack of EAP students'

motivation to use computers in EAP learning might be related to their lack of computer literacy or EAP practitioners' negligence in identifying their technological needs.

Jarvis (2009) maintains that EAP authorities should pave the way for the integration of computers into EAP courses. This implies that possible barriers to the use of computers should be removed. Admittedly, CALL will be normalized (Bax, 2003) in EAP contexts if we eliminate some limitations such as time restrictions, low computer literacy of educational stakeholders and the lack of computers (Ioannou-Georgiou, 2006). Moreover, EAP students' levels of English proficiency should be improved so that they can make use of various Internet-based and computer-based applications in English. The results of this study are commensurate with the limitations that Jarvis (2009) identified regarding the use of technology in EAP instruction, including practical limitations, and insufficient computer competence of EAP practitioners.

5. Conclusions and recommendations

The present research has offered insights into the perceptions of EAP students and instructors of computer literacy levels. Based on the findings, it appears that EAP students did not have adequate computer literacy levels to use computer applications which can be used for EAP learning. This issue should be taken into consideration by EAP providers and authorities and they should implement measures and plans in order to foster EAP students' computer literacy levels. Findings related to participants' perceptions unraveled that specific computer literacy training courses and programs can be offered to EAP students. EAP instructors should use computer applications and resources and encourage their students to use technology in EAP courses. More importantly, the findings identified the types of computer-based needs and skills that EAP students perceived as important for EAP learning. These needs include using online English dictionaries, using various search engines, developing advanced word-processing skills, exchanging academic emails in English, participating in English academic forums, reading and using academic cyber-genres, and using computers in conducting academic research.

Despite EAP students' interest in fostering their computer literacy and the considerable role of computer competence in EAP students' academic and EAP learning, several pragmatic constraints were identified which might restrict learners' use of computers. Definitely, these limiting factors which hinder the integration and use of technology in EAP courses should be detected and eliminated. Eliminating these constraining parameters will

facilitate the integration of technology in EAP courses and enhance students' motivation for and interest in using technology for their EAP and academic learning.

There are a plethora of opportunities and directions for future research since the issue of computer literacy in EAP instruction is still not a fully explored area of study. More research is needed into the nature of each computer literacy skill which might be related to EAP learning. In addition, future research is expected to evaluate the actual use of different computer applications and skills in EAP courses in order to identify the gap between EAP students' perceptions and their actual computer-based needs.

Lastly, it is equally important that more similar context-based and local studies be carried out in other countries concerning EAP students' technological needs and computer competence as well as barriers to the use of technology (Dashtestani, 2012). Obviously, the issue of EAP students' computer literacy is an important one and insights which might be gained from research in this realm would benefit future EAP course designing drastically.

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Appendix 1. Computer literacy questionnaire

Dear participants,

The following questionnaire is part of a research project that investigates the perceptions of undergraduate students of CE about their levels of computer literacy and challenges to include computers in Iranian EAP courses.

Section I: *Background Information*

Name of University: _____

Gender: _____

Age: _____

Section II: *Students' perceptions of their computer literacy*

The second section of the questionnaire aims to explore the perceptions of EAP students of CE of their levels of computer literacy. Please tick (✓) the relevant choice for each question.

Items	Not proficient	Fairly proficient	A little proficient	Proficient
1. Using a scanner to import graphics				
2. Installing programs on a hard disk				
3. Using PowerPoint for educational purposes				
4. Sending and receiving e-mails				
5. Using the Internet				
6. Using the computer in academic researching				
7. Fixing common software problems				
8. Fixing common hardware problems				
9. Typing skills				
10. Using suitable search engines				
11. Printing selected information from a database				
12. Installing operating systems				
13. Using a word-processor to create documents				
14. Creating a spreadsheet				
15. Creating a database				
16. Programming skills				
17. Accessing information on a CD-ROM				
18. Copying files				
19. Deleting files				
20. Formatting drives				
21. Creating and maintaining a basic weblog				
22. Digital image manipulation				
23. Using a Wiki				

24. Using RSS feeds to store and retrieve information
25. Writing a compact disk

Section III: Factors that limit the use of computers

The third section aims to explore the perceptions of CE students of the limitations of using computers in EAP courses. Please tick (✓) the relevant choice for each question.

Items	Not important	Fairly important	Important	Very important
1. Lack of time				
2. Lack of computers at universities				
3. Hardware problems				
4. Slow computers at universities				
5. Lack of competence in appropriate use of computers				
6. Not being motivated to use computers				
7. High cost of using computers				

Please tick (✓) the relevant choice for each question.

Section IV: Attitudes toward computer literacy

1. How important is the role of computer literacy in your success in EAP courses?
 A) Not important B) Fairly important C) Important D) Very important
2. How important is the role of computer literacy in your academic success?
 A) Not important B) Fairly important C) Important D) Very important

Section V: Having a course on computer literacy training

3. Do you agree to have a course on developing your computer literacy?
 A) Strongly disagree B) Disagree C) Agree D) Strongly agree

Section VI: Open-ended questions

In this section write any problem or strategy regarding the notion of computer literacy that you assume is useful for the purposes of the current study:

1: _____

2: _____

3: _____