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English for Academic Purposes Instructors' Use and Acceptance of Technology in EAP Courses

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Abstract

Despite the fact that a large number of studies have been carried out on teachers' attitudes towards CALL and technology use in language learning contexts, very limited attention has been directed towards EAP instructors' perspectives on technology integration/use. This mixed-methods study was undertaken to investigate the affordances and limitations of technology use in EAP courses from EAP instructors' perspectives. Participants of the study were 87 EAP instructors who taught EAP at Iranian universities. Questionnaires and semi-structured interviews were used to explore the perspectives of the participants. The findings revealed that the EAP instructors were positive about the use of technology in EAP courses, while they demanded for the development and access to more needs-based and major-specific software tools and applications for EAP students of different majors. It was also depicted that CALL needs analysis projects should be conducted before employing any type of technology in EAP courses. The EAP instructors pointed out several limitations and measures that should be taken into account by EAP and university decision-makers and course designers. The study offers practical and theoretical implications and applications for the integration and use of technology in EAP instruction.

Keywords: EAP, instructors, technology integration, CALL, needs analysis

Introduction

Technology has become a flexible and effective learning and teaching tool for university students and teachers all over the world (Cheung & Slavin, 2013; Jeong, Shin, & Park, 2015; Kuech & Kimball, 2003; Langan, et al., 2016; Rock & Passe, 2004). At the university level, technology integration would introduce new ways of communication for students and enable them to learn without the limits of distance and time factors. Moreover, the integration of information and communication technologies (ICT) can enable university students to join academic communities of practice. Technology integration can also motivate university students to gain knowledge and use their knowledge in a way to meet the needs and requirements of the society. Therefore, a technology-based approach to learning may be responsive to the changing conditions and needs of universities in the modern age (Atkins, 2005).

The field of language teaching is not separate from the changes of other educational fields since the interest to incorporate learning technologies has grown rapidly during the recent decades. As a result, experts and researchers of language teaching have explored the possible opportunities and challenges of the use of technology in language learning contexts (Ban & Summers, 2010; Baydas

& Goktas, 2016; Hu & McGrath, 2011; Li & Ni, 2011; Lida, Paola, Eva, & Verónica, 2017; Qi Dong, 2009; Teo, 2011; Wang & Coleman, 2009). The merits of technology use in language teaching contexts include meeting the needs, preferences, and interests of individual students, the opportunity of the use of authentic materials, the use of a variety of materials, the possibility of ubiquitous learning, a personalized approach to learning, increasing students' motivation and confidence, efficient and self-directed learning, and knowledge consolidation (Maszkowska, 2017).

Furthermore, teachers play a key role in the implementation of CALL and motivating students to use technology for their learning purposes (Dashtestani, 2012). For this reason, a plethora of studies have been conducted to identify English as a foreign language (EFL) teachers' attitudes towards the use of technology and the implementation of CALL in EFL contexts (e.g., Başöz & Çubukçu, 2014; Bouchefra, & Baghoussi, 2017; İnce, 2017; Nila, 2013; Onsoy, 2004). The results of these studies are indicative of the positive attitudes of EFL teachers towards CALL in spite of the presence of several challenges and impeding factors to successful integration of technology in EFL courses.

English for academic purposes (EAP) is "the teaching of English with the specific aim of helping learners to study, conduct research or teach in that language"(Flowerdew & Peacock, 2001, p. 8). In Iran, EAP constitutes an essential part of university curricula of all disciplines and majors in that university students need to pass EAP courses before graduation. The aim of these EAP courses is to acquaint university students with academic reading and technical vocabulary. Thus, enhancing the quality of EAP instruction in Iran is a very important goal of the educational system. EAP students need to be exposed to authentic major-specific texts; therefore, technology can be a suitable means to provide EAP students with a plethora of rich and authentic texts in various modes and through different channels (Jarvis, 2009). Likewise, computer-assisted language learning (CALL) can play a pivotal role in EAP instruction (García Laborda, & Litzler, 2015; García Laborda, & Litzler, 2017; Jarvis & Pastuszka, 2008). Plastina (2003) suggests that the use of technology in EAP courses can provide a wide range of benefits for EAP students and instructors. EAP students can have access to up-dated learning resources and EAP instructors can improve their teaching materials, identify their students' needs, and enhance their teaching methodologies. García Laborda (2011) also points out that the use of the Internet can have a great number of benefits for ESP instruction materials development.

The other major contribution of technology use to EAP courses is the opportunity to use the Internet and other Web-based tools and applications. This implies that EAP instruction can be more accountable to the needs and wants of students and provide them with more major-specific and needs-based materials and learning resources (Arno, 2012; Atai & Dashtestani, 2013). It is also paramount that EAP students become able to use technologies relevant to EAP learning effectively (Jarvis, 2009). The integration of technology in EAP courses can meet the dynamic needs and requirements of EAP stakeholders and give both instructors and students a great number of options and affordances to boost up their educational practices and activities.

Literature review

As for teachers' attitudes towards the use of technology in educational contexts, Banas (2010) carried out a study on teachers' attitudes towards technology aiming to provide some implications for designing teacher education programs. Having based the study on the technological pedagogical content knowledge (TPCK) framework, she reported that the majority of teachers were positive about the use of technology, while some teachers had some concerns about the obstacles of technology use in education such as time restrictions, low confidence levels, and inadequate competence to make use of technology for educational purposes. In Kazakhstan, Mustafina (2016) explored teachers' attitudes towards technology integration. The positive reactions of teachers towards technology were identified. Also, some factors such as confidence, knowledge, gender, and age were reported to have an effect on the attitudes of teachers towards technology use. It was further revealed that the attitudes of teachers might have an impact on students' motivation to use technology. Akturk, Izci, Caliskan, and Sahin (2015) examined pre-service teachers' perspectives on technology use and factors which may affect teachers' attitudes. They found that male teachers had relatively a more positive attitude towards technology use in comparison to female ones. In addition, teachers' duration of Internet use and their number of digital devices had a positive correlation with their positive attitudes towards technology. Scherer, Tondeur, Siddiq, and Baran (2018) conducted another study on the link between teachers' technological, pedagogical, and content knowledge (TPACK) and attitudes towards technology using a structural equation modelling approach. They reported there exists a positive correlation between teachers' perceptions of TPACK and their attitudes towards technology.

Similarly, having taken into account several variables, Birkollu, Yucesoy, Baglama, and Kanbul, (2017) analyzed pre-service teachers' perspectives on the use of technology in education. Apart from teachers' positive attitudes towards technology use in education, gender was shown to be a factor which influenced teachers' attitudes in that the male teachers had a higher level of self-efficacy in comparison to the female ones. Also, those who had attended a training course before the study had a more positive attitude towards technology compared to those who had not attended a training course at all. Another interesting finding was that teachers from different departments had different views towards technology. The average hours the teachers used computers was another factor which affected their attitudes towards technology. Usta and Korkmaz (2010) examined social sciences and education teachers' computer literacy levels and their acceptance of technology. It was reported that the teachers believed to have a high level of computer literacy. Teachers from the education department perceived to have a higher level of computer literacy than those from the social sciences department. The teachers from both departments held positive attitudes towards technology use. It was suggested that promoting teachers' computer literacy would augment their positive attitudes towards technology use. Avidov-Ungar and Eshet-Alkalai (2011) implemented a study on teachers' attitudes towards the use of modern technologies at schools. The study suggested that there was a positive correlation between TPACK and teachers' attitudes towards technology and change. The teachers who achieved a high score in the TPACK test had also positive attitudes towards change and the use of innovative technologies. Donmuş, Akpinar, and Eroğlu (2015) further assessed pre-service teachers' attitudes towards the teaching profession and their technology self-efficacy. It was indicated that the male teachers had a higher level of technology self-efficacy than the female teachers. In contrast, female teachers were more positive about their teaching profession in comparison to the male teachers. Teachers from different departments had different views towards information technologies and their teaching profession.

In the EFL context, Dashtestani (2012) explored Iranian EFL teachers' attitudes towards technology and CALL. The results of the mixed-methods study provided evidence that Iranian EFL teachers adopted positive attitudes towards the use of technology and implementation of CALL in EFL courses. The perceived benefits of technology use in EFL courses included the enhancement of learners' motivation and responsibility for learning, easy access, time efficiency, and interactivity. On the contrary, some challenges of technology use in EFL courses, including a lack of time to use technology, the absence of proper facilities and equipment, the inflexible EFL curriculum, and a lack of teacher preparation for technology use were reported by Iranian EFL teachers. Following the same research strand, Başöz and Çubukçu (2014) examined Turkish pre-service teachers' perspectives on the implementation of CALL in EFL courses. They reported that the EFL pre-service teachers were generally positive about the implementation of CALL. The perceived merits of CALL were the convenience that it brings to the class, flexibility, and its facilitative role in learning listening and vocabulary. However, there was not a consensus among pre-service teachers about the effective role of computers in teaching writing and oral skills. Bouchefra, and Baghoussi (2017) reported on a study on Algerian EFL teachers' attitudes towards CALL. They suggested the majority of EFL teachers held positive attitudes towards CALL. The teachers were aware that digital literacy and the ability to use computers properly were important prerequisites of CALL implementation. One remarkable perceived limitation was a lack of CALL teacher training for EFL teachers due to the negligence of curriculum developers and course designers. It was also revealed that the teachers had very limited use of technology for their teaching purposes.

Furthermore, İnce (2017) investigated the attitudes of EFL teachers towards CALL and factors which might play a role in the attitudes of the teachers. The findings indicated both positive responses and concerns as to the use of technology in EFL courses. It was suggested that EFL teachers were unsure and at times frustrated due to their lack of competence to using technology in their courses. The teachers also confirmed that the use of technology in EFL courses can foster the learning of four skills. Some perceived barriers to the use of technology in EFL courses such as the lack of training, improper and limited facilities, and teachers' anxiety and lack of competence were further discussed and identified. In Bangladesh, Nila (2003) analyzed EFL teachers' attitudes towards CALL. The teachers were reported to have positive perceptions about the implementation of CALL. The negative aspects of implementing CALL comprised the lack of class time to implement CALL, the high costs of computer use, the problems of the educational system, and the lack of understanding of CALL on the part of teachers. The perceived benefits consisted of the promotion of all language skills, time efficiency, the use of audio-visual properties, and the use of new techniques in the class. In the same way, Onsoy (2004) conducted a study on students' and teachers' attitudes towards CALL. The study supported the fact that the teachers had positive attitudes towards the use of technology in their EFL courses. It was recommended that training be provided for both teachers and students with regard to the use of technology.

In the ESP/EAP context, technology use is a major research line and a great number of studies have been carried out in this regard (e.g., Fofanov, Sidorenko, & Zamyatina, 2010; Khosravani, & Khoshsima, 2017; Li & Wang, 2016; Miller, Hafner, & Fun, 2012). The findings of studies on technology use in ESP suggest that technology can enhance teaching and learning practices and provide a staunch and interactive learning environment in EAP courses. Dashtestani and Stojkovic

(2016) have presented a review of the use of technology in ESP and identified several benefits of technology use in ESP instruction. However, they have concluded that there is a dearth of research about many aspects of technology use in ESP instruction and there is a need to conduct more studies in order to enrich the literature of the use of technology in ESP instruction.

Despite the specific contexts of EAP courses and the particular needs of EAP students which make EAP instruction different from EFL instruction, very limited well-documented research has been directed towards analyzing the perspectives of EAP instructors of the benefits and limitations of the use of technology in EAP courses. Therefore, to fill in the gap and provide a more comprehensive picture of the problems and possibility of technology use in EAP courses, this study aims to examine the attitudes of Iranian EAP instructors towards technology use in EAP instruction and its challenges and possible pedagogical and educational opportunities. Bearing these aims in mind, the following research questions were formulated:

1. What are Iranian EAP instructors' perspectives on the use of technology in EAP courses?

2. What are Iranian EAP instructors' perspectives of the main challenges to technology use in EAP instruction?

3. What measures should be taken in order to facilitate the integration of technology in EAP courses from Iranian EAP instructors' perspectives?

Method

A mixed-methods design was taken into account in that both qualitative and quantitative methods were used. Since attitudes, perceptions, and beliefs of individuals are of an elusive and dynamic nature, both qualitative and quantitative data should be collected and analyzed. Therefore, a triangulation of the data sources was considered in order to come up with more valid and reliable results.

Participants

A total of 87 EAP instructors from 10 Iranian universities took part in the questionnaire study. The participants' average age was 45.7. Regarding the university degree of the participants, 62 of them were the holders of a master's degree and 25 of them held a PhD degree in teaching English as a foreign language (TEFL). The participants had an average of 6.9 years of teaching EAP. In the questionnaire, the instructors were asked to indicate their digital literacy levels and their level of digital literacy was perceived to be pre-intermediate or intermediate. Both female and male instructors were included in the study. Since access to EAP instructors was not easy, the questionnaire was only administered to those who were volunteered and available at the time of data collection. The instructors taught EAP in different faculties, including the engineering, arts, social sciences, and medicine faculties. For the interview phase of the study, 38 EAP instructors accepted the invitation to participate in the interview phase of the study (Table 1).

Table 1. Demographic information of the participants

Total number of instructors	87
Average age	45.7
University degree	MA (n=62), PhD (n=25)
Years of EAP teaching experience	6.9 years
Sample proportion	
Faculty of engineering	22 EAP instructors
Faculty of fine arts	18 EAP instructors
Faculty of social sciences	25 EAP instructors
Faculty of medicine	22 EAP instructors

Instrumentation

Questionnaires

A Likert item questionnaire was adapted based on the questionnaire designed by Dashtestani (2012) on Iranian EFL teachers' attitudes towards the implementation of CALL. The items of the questionnaire were re-checked by a panel of six EAP and CALL university professors to adapt the use of the items for the EAP context. Several revisions and amendments were made on the content of the items. The adapted questionnaire was also piloted with a group of ten Iranian EAP teachers before the conduction of the study and further improvements were made on the items. Also, Cronbach's Alpha coefficients were estimated for different sections of the questionnaire and a high range of consistency was achieved (0.86-0.92). As for the sections of the questionnaire, the first section explored Iranian EAP instructors' perspectives on the use of technology in EAP courses. This section included 20 items with Likert items ranging from strongly disagree to strongly agree. The second section of the questionnaire, which comprised 20 items, was designed to examine Iranian EAP instructors' perceptions of the main challenges to technology use in EAP instruction with Likert items ranging from strongly disagree to strongly agree. The third section was a scrutiny into measures which should be taken in order to facilitate the integration of technology in EAP courses from Iranian EAP instructors' perspectives with Likert items ranging from strongly disagree to strongly agree.

Interviews

To triangulate the results of the questionnaires and interviews, the interview questions were developed in line with the aims of the questionnaires. The participants were asked about their attitudes towards the use of technology in EAP courses and whether they agreed to such use, their opinions of the challenges and obstacles to the use and inclusion of technology in Iranian EAP courses, and their proposed suggestions, recommendations, and strategies in order to use/integrate technology in EAP courses. The questions of the interviews were checked by the same panel of EAP and CALL professors who also established the content validity of the questionnaire items. The use of the questions of the interviews was piloted with a group of five EAP instructors in order

to check the suitability of the questions for the purposes of the study. The ethical aspects of the study were strictly observed at all stages of conducting the study. The participants' participation in the study was voluntary and consent forms were given to the participants in order to avoid any misunderstanding on the part of the participants.

Data analysis

The mean and standard deviation were used in order to depict the results of the questionnaire. SPSS version 16 was used to analyze the data. For the consistency of the questionnaire, Cronbach's Alpha was estimated and reported. The data of the interviews were analyzed through content analysis. Two raters coded the interview data and the common themes reported by the two raters were reported as the final results in the study. An inter-rater reliability analysis was performed to assess the raters 'coding consistency and a high level of consistency (0.90) was shown.

Results

Iranian EAP instructors' perspectives on the use of technology in EAP courses

Questionnaires

The questionnaire results show the generally positive attitudes of EAP instructors towards the use of technology in EAP instruction (Table 2). Specifically, the participants pointed out some benefits of technology use in EAP instruction. The participants believed that technology facilitates the process of EAP teaching, CALL in EAP instruction enhances students' motivation, computers should be available to EAP students, they were willing to learn how to use computers in EAP instruction, CALL can be used to teach different language skills and activities, technology brings variety to EAP courses, EAP courses should be equipped with computers, technology gives EAP teachers different pedagogical options in their teaching, having technological knowledge is very important for EAP teachers, it is easy to learn how to work with computers for EAP teachers, EAP teachers should be encouraged to use technology in their classes, using computers in EAP courses enhances students' autonomy, computers are very effective to improve EAP students' intercultural competence, using computers in EAP classes facilitates access to major-specific academic information, implementing CALL promotes EAP teachers' professional development, and technology can be easily combined with EAP teaching.

Table 2. Perspectives on the use of technology in EAP courses

N=87	**Mean**	**SD**
Technology facilitates the process of EAP teaching	4.32	0.71
CALL in EAP instruction enhances students' motivation	4.29	0.77

Computers should be available to EAP students	4.18	1.01
I am willing to learn how to use computers in EAP instruction	4.31	0.8
EAP courses should be equipped with computers	4.37	0.82
CALL can be used to teach different language skills and activities of EAP	4.28	1.07
Technology brings variety to EAP courses	4.15	1.66
Technology gives EAP teachers different pedagogical options in their teaching	4.24	1.19
Having technological knowledge is very important for EAP teachers	4.29	1.16
It is easy to learn how to work with computers for EAP teachers	4.47	0.83
EAP teachers should be encouraged to use technology in their classes	4.28	1.01
Using computers in EAP courses enhances students' autonomy	4	0.92
Computers are very effective to improve EAP students' intercultural competence	4.04	0.73
Computers help EAP teachers to assess students effectively	3.29	1.34
Computers help EAP teachers provide students with appropriate feedback form	3.1	1.44
Using computers in EAP classes facilitates access to major-specific	4.68	0.58

academic information		
CALL programs improve interactivity in EAP courses	3.79	1.1
Implementing CALL promotes EAP teachers' professional development	4.4	0.82
Computers define new roles for EAP Teachers	3.67	1.25
Technology can be easily combined with EAP teaching	4.46	0.76

Interviews

In the interviews, all the participants agreed with the use of technology in EAP courses. Regarding the benefits of technology use for EAP courses, the instructors referred to some merits, including opportunities for accessing authentic academic resources, opportunities for better communication with international academic communities, the possibility of making EAP courses more motivating for students, the use of up-dated resources and materials, meeting the technological needs of EAP students, developing variety in terms of materials teaching techniques in EAP courses, using major-specific applications and software tools, and more opportunities for learner-centered EAP teaching (Table 3).

Table 3. Perspectives on the use of technology in EAP courses

Theme
Opportunities for accessing authentic academic resources
Opportunities for better communication with international academic communities
The possibility of making EAP courses more motivating for students
The use of up-dated resources and materials
Meeting the technological needs of EAP students
Developing variety in terms of materials teaching techniques in EAP courses

Using major-specific applications and software tools

More opportunities for learner-centered EAP teaching

Iranian EAP instructors' perceptions of the main challenges to technology use in EAP instruction

Questionnaires

The second section of the questionnaire explored EAP instructors' perceptions of the main challenges to technology use in EAP instruction. The participants reported some limitation of technology use in EAP instruction. The perceived challenges include computers are not available in EAP courses, there is a lack of CALL-based facilities in EAP courses, EAP teachers' and students' levels of digital literacy are too low to implement CALL, EAP teachers lack knowledge about CALL methodology and implementation, there is a lack of CALL teacher training/education in EAP teacher training (education) programs, there is a lack of attention of EAP educational course designers to include CALL in EAP courses (Table 4)

Table 4. Perceptions of the main challenges to technology use in EAP instruction

N=87	**Mean**	**SD**
Computers are not available in EAP courses	4.37	0.87
EAP students and teachers might be technophobic to use technology	3.67	1.11
EAP teachers have less control over their classes when CALL is implemented	2.87	1.3
It is hard to implement CALL in EAP classes	2.06	0.8
Using computers in EAP courses is energy-and-time consuming	1.95	0.73
Computers cannot be used for teaching different EAP skills	1.67	0.84

and activities

CALL may cause injustice in EAP courses since some students are more familiar with computers than the others	1.56	0.86
Cultural resistances of students and instructors to use computers are an important obstacle to implementing CALL in EAP	2.02	0.96
There is a lack of CALL-based facilities in EAP courses	4.08	0.89
Computers are inefficient to handle unexpected situations	1.84	0.81
Technology might be a distractor than an aid for EAP learners	1.73	0.69
CALL reduces the quality of interactions in EAP courses	1.67	0.77
It is difficult to produce computer-based materials for EAP teachers	2.32	0.91
EAP teachers' computer literacy is too low to develop computer-based materials	2.95	1.06
EAP Teachers' and students' levels of digital literacy are too low to implement CALL	4.27	0.94
EAP teachers lack knowledge about CALL methodology and implementation	4.49	0.76
There is a lack of CALL teacher training/ education in EAP teacher training (education) programs	4.16	0.98
CALL software is inadequate to meet students' needs	2.17	0.91

There is a lack of attention of EAP educational course designers to include CALL in EAP courses	4.18	1

Interviews

The results of interviews revealed some new and serious challenges to technology use in EAP instruction. These challenges include the lack of technology-based facilities in EAP courses, the low status of academic English teaching in the university curriculum, the dominance of traditional approaches to EAP instruction in the university curriculum, the lack of knowledge of/familiarity with major-specific academic applications, disinterest of some EAP instructors in changing their old teaching methodologies, and the lack of knowledge of/familiarity with new learning technologies (Table 5).

Table 5. Perceptions of the main challenges to technology use in EAP instruction

Theme
Lack of technology-based facilities in EAP courses
The low status of academic English teaching in the university curriculum
The dominance of traditional approaches to EAP instruction in the university curriculum
Lack of knowledge of/familiarity with major-specific academic applications
Disinterest of some EAP instructors in changing their old teaching methodologies
Lack of knowledge of/familiarity with new learning technologies

Measures to be taken in order to facilitate the integration of technology in EAP courses

Questionnaires

As Table 6 reveals, the participants perceived all the measures included in the questionnaire as important. Including CALL in EAP teacher training/education programs, funding teachers to purchase the necessary software to be used in EAP courses, having workshops on how to implement CALL in EAP courses, having on-the-job CALL training courses, awareness-raising programs on the uses and benefits of CALL for EAP, providing EAP teachers with adequate

facilities to implement CALL, providing EAP teachers with enough class time to implement CALL, and updating EAP teachers' knowledge about new CALL software periodically were the measures the majority of the participants agreed or strongly agreed with.

Table 6. Measures to be taken in order to facilitate the integration of technology in EAP courses

N=87	**Mean**	**SD**
Including CALL in EAP teacher training/education programs	4.11	1.01
Funding teachers to purchase the necessary software to be used in EAP courses	4.28	0.78
Having workshops on how to implement CALL in EAP courses	4.31	0.94
Having on-the-job CALL training courses	4.35	0.9
Awareness-raising programs on the uses and benefits of CALL for EAP	4.12	0.89
Providing EAP teachers with adequate facilities to implement CALL	4.65	0.72
Providing EAP teachers with enough class time to implement CALL	4.10	0.77
Updating EAP teachers' knowledge about new CALL software periodically	4.22	0.8

Interviews

Based on the values in Table 7, the participants proposed several practical measures to be taken to integrate technology in EAP instruction. The measures include encouraging EAP teachers and students to use EAP-related technologies, providing EAP teachers and students with proper EAP-related technologies, training EAP students and teachers to use EAP technologies properly, conducting needs analysis projects on EAP students' technological needs, equipping EAP courses with proper technological facilities, producing needs-based software tools for EAP students, inviting Iranian EAP decision-makers to consider technology as a learning tool for EAP students,

and training/awareness-raising of EAP teachers to use technology-based materials and teaching methodologies.

Table 7. Measures to be taken in order to facilitate the integration of technology in EAP courses

Theme
Encouraging EAP teachers and students to use EAP-related technologies
Providing EAP teachers and students with proper EAP-related technologies
Training EAP students and teachers to use EAP technologies properly
Conducting needs analysis projects on EAP students' technological needs
Equipping EAP courses with proper technological facilities
Producing needs-based software tools for EAP students
Inviting Iranian EAP decision-makers to consider technology as a learning tool for EAP students
Training/awareness-raising of EAP teachers to use technology-based materials and teaching methodologies

Discussion

This study strived to identify the possibility of technology use and integration from the perspectives of Iranian EAP instructors. The results of the mixed-methods study approved the suitability and potential effectiveness of technology use and integration in EAP instruction. The participants also pointed out several perceived beneficial aspects of technology use in EAP instruction. A significant part of the results is commensurate with the findings of previous studies which reported on the positive attitudes of EFL teachers towards the use of technology (e.g., Başöz & Çubukçu, 2014; Bouchefra & Baghoussi, 2017; Dashtestani, 2012; İnce, 2017; Nila, 2013; Onsoy, 2004). This awareness of the potential effectiveness of technology use for EAP instruction is of great importance and would pave the way for more efficient EAP courses which can focus on the realistic needs and preferences of EAP students and expert comments and conceptions of EAP instructors. It is also worth mentioning that unlike EFL teachers, EAP instructors are aware of some specific and academic needs of students which can be met through the use of technology.

For example, the potential of technology to join EAP students to international communities of practice was a very important finding which was identified in instructors' interview results. Thus, it can be concluded that some benefits of technology use for EAP instruction are based on the specific needs of EAP students such as joining international academic communities of practice.

The other particular advantage of technology use for EAP instruction is the opportunity to use major-specific software tools and applications as mentioned by the EAP instructors. This can be an important finding which depicts that CALL and technology-enhanced learning can have relevant and needs-specific affordances for EAP learning and teaching contexts. Therefore, for a more effective course designing and curriculum developing, EAP decision-makers need to motivate EAP instructors, content instructors, and IT experts to conduct joint projects in order to produce needs-based and major-specific software tools and applications for EAP students. For instance, major-specific writing and genre awareness/instruction software tools can be extremely beneficial to EAP instructors, content instructors, and EAP students.

The use of technology in EAP instruction has shown to provide opportunities for using authentic EAP resources in the classroom. The use of authentic materials such as scientific research papers, reports, dissertation, etc. can be closely pertinent to the needs of EAP students. Technology has the potential to pave the way for preparing students to learn how to use and stick to the norms of their own academic community and obey the writing conventions of different genres and text types. The use of the Internet and Web-based sources is a sound strategy to provide EAP students with rich and various academic authentic materials (Atai & Dashtestani, 2013). As a result, it is paramount that Web-based and Internet-based facilities of universities be improved and overhauled so that EAP students and teachers have the chance to access authentic learning and teaching resources ubiquitously and easily.

As for the challenges of the use of technology in EAP instruction, several limitations were perceived and reported by the EAP instructors. A lack of facilities to use technology in EAP instruction is a problem that has been reported in several other studies as well (e.g., Dashtestani, 2012; İnce, 2017). Since EAP courses are relevant to university students' success in their academic career and learning process, any investment on providing the required facilities can boost the quality of educational practices at universities. Therefore, it can be valuable if more attention be directed towards providing the hardware elements of technology for EAP instruction and learning.

The other shortcoming which might be exclusive to EAP instruction is the instructors' lack of familiarity with technologies and major-specific applications that EAP students need to be exposed to. This is a significant barrier for both EAP instructors and content instructors. In order to choose the most appropriate and needs-based technology for EAP students, a cooperation between EAP and content instructors is inevitable. Both content instructors and EAP instructors should participate in conducting CALL needs analysis projects for EAP students of different majors and come up with realistic solutions and guidelines for producing effective and major-specific technologies and applications for EAP students. Logically, these needs analysis project are not possible to be carried out without sufficient attention of EAP course designers and supervisors, while the provision of financial supports for such projects might be another issue which should be taken into account.

One important finding of this study is that any kind of CALL material, resource, application, and learning practice should be founded on the needs of EAP students. Therefore, it is desired to develop different CALL courses for EAP students of different majors. It seems that EAP instruction is strictly based on the needs, preferences, wants, and attitudes of EAP stakeholders and disregarding these stakeholders in any educational planning or activity might distort the real needs and real requirements of those students who study that major.

The EAP instructors also suggested various strategies and measures which can be taken into account in order to integrate and use technology in EAP courses. The need for training for both EAP instructors and students was a significant finding which suggests that digital literacy and knowledge of CALL principles and procedures might play a pivotal role in the proper use of technology in the EAP classroom. Moreover, it is paramount to encourage EAP instructors to stop using old teaching methodologies and techniques through acquainting them with more advanced and up-dated technological methods and approaches to learning and teaching.

Conclusion

The mixed-methods study provided strong evidence for the integration of CALL and technology-enhanced approaches into the EAP curriculum of Iran. Even though there might exist some contextual differences and variations, stakeholders of other EAP contexts can have similar technological needs and preferences. The findings of the present study have several implications for the Iranian commonly top-down EAP curriculum. Therefore, considering EAP instructors' needs, viewpoints, and expert comments may have a direct impact on the improvement of EAP courses and a better understanding of the dynamic context of EAP instruction. No change can be made without providing the essential financial and training support. The infrastructure and hardware of technology are significant issues that need to be taken into account and some practical and immediate measures should be taken in order to make substantial technological changes to the EAP curriculum in Iran.

In the same way, planning EAP courses regardless of EAP students' and instructors' dynamic needs is not a wise strategy and might waste a large amount of budget and energy both on the side of the planning stakeholders (course planners) and the practicing stakeholders who are students and instructors. Due to the fact that technology is a dynamic and an elusive concept which witnesses a large number of changes from time to time, needs analysis projects on the digital and technological needs of EAP students should be carried out on a regular basis. Emerging technologies can have remarkable impacts on the process of learning academic English. Identifying these new technologies and adapting them to the requirements of EAP courses is not an easy undertaking though.

Similarly, training should also be provided for teachers on a regular basis. Teachers should be trained to enhance their digital literacy and foster their expertise in order to make innovative use of different types of technologies in EAP courses. This type of training would have a direct effect on teachers' professional development process and make them more autonomous in line with the principles and tenets of the post-method era of language teaching. One important role or activity of teachers in EAP instruction is materials development. When it comes to EAP instruction, materials development might become a complicated process (García Laborda, 2011). Enabling

EAP instructors to produce CALL Web-based materials for EAP instruction can be a very effective choice. Thus, the first step is to raise the awareness of EAP instructors about the use of technology in EAP instruction and the next stage is to equipping them with the required competences in order to cope with the demands of CALL in their courses.

References

Akturk, A. O., Izci, K., Caliskan, G., & Sahin, I. (2015). Analyzing pre-service teachers' attitudes towards technology. *International Journal of Educational and Pedagogical Sciences, 9*(12), 4286-4292. Retrieved from https://files.eric.ed.gov/fulltext/ED563253.pdf

Arno, E. (2012). The role of technology in teaching languages for specific purposes courses. *Modern Language Journal, 95*, 88-103. doi: 10.1111/j.1540-4781.2012.01299.x

Atai, M. R., & Dashtestani, R. (2013). Iranian English for academic purposes (EAP) stakeholders' attitudes toward using the Internet in EAP courses for civil engineering students: promises and challenges. *Computer Assisted Language Learning, 26*(1), 21-38. doi.: 10.1080/09588221.2011.627872

Atkins, D. E. (2005). University futures and new technologies: Possibilities and issues. In *Unpublished discussion paper for an OECD expert meeting*. Retrieved from www. oecd.org

Avidov-Ungar, O., & Eshet-Alkalai, Y. (2011). Teachers in a world of change: Teachers' knowledge and attitudes towards the implementation of innovative technologies in schools. *Interdisciplinary Journal of E-Learning and Learning Objects, 7*(1), 291-303. Retrieved from www.ijello.org/Volume7/IJELLOv7p291-303Avidov-Ungar767.pdf

Ban, R., & Summers, R. (2010). Using Web 2.0 tools for English as a foreign language teacher reflective practice. *MexTesol Journal*, *34*(2), 2395-9908. Retrieved from http://mextesol.net/journal/index.php?page=journal&id_article=53

Banas, J. R. (2010). Teachers' attitudes toward technology: Considerations for designing preservice and practicing teacher instruction. *Community & Junior College Libraries, 16*(2), 114-127. Doi: 10.1080/02763911003707552

Başöz, T., & Çubukçu, F. (2014). Pre-service EFL teacher's attitudes towards Computer Assisted Language Learning (CALL). *Procedia-Social and Behavioral Sciences, 116*, 531-535. doi: 10.1016/j.sbspro.2014.01.253

Baydas, O., & Goktas, Y. (2016). Influential factors on pre-service teachers' intentions to use ICT in future lessons. *Computers in Human Behavior, 56*, 170-178. doi: 10.1016/j.chb.2015.11.030

Birkollu, S. S., Yucesoy, Y., Baglama, B., & Kanbul, S. (2017). Investigating the attitudes of pre-service teachers towards technology based on various variables. *TEM Journal, 6*(3), 578. Retrieved from https://www.ceeol.com/search/article-detail?id=560181

Bouchefra, M., & Baghoussi, M. (2017). Algerian EFL university teachers' attitudes towards computer assisted language learning: The case of Djilali Liabes University. *International Journal of Education and Literacy Studies, 5*(2), 132-139. Retrieved from www.journals.aiac.org.au/index.php/IJELS/article/view/3491

Cheung, A. C., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. *Educational*

research review, *9*, 88-113. doi: 10.1016/j.edurev.2013.01.001

Dashtestani, R. (2012). Barriers to the implementation of CALL in EFL courses: Iranian EFL teachers' attitudes and perspectives. *The JALT CALL Journal, 8*(2), 55-70. Retrieved from https://www.researchgate.net/publication/256839551_Barriers_to_the_implementation_of_CALL_in_EFL_courses_Iranian_EFL_teachers%27_attitudes_and_perspectives

Dashtestani, R., & Stojkovic, N. (2016). The use of technology in English for Specific Purposes (ESP) instruction: A literature review. *Journal of Teaching English for Specific and Academic Purposes, 3*(3), 435-456. Retrieved from http://espeap.junis.ni.ac.rs/index.php/espeap/article/view/304

Donmuş, V., Akpinar, B., & Eroğlu, M. (2015). Analysis on the relationship between the attitude of teacher candidates towards teaching profession and the perception of ICT self-efficacy. *International Journal of Learning and Teaching, 1*(2), 139-144. Retrieved from www.ijlt.org/uploadfile/2015/1123/20151123120146999.pdf

Flowerdew, J., & Peacock, M. (2001). Issues in EAP: A preliminary perspective. In J. Flowerdew and M. Peacock (eds.), *Research Perspectives on English for Academic Purposes* (pp. 8-24). Cambridge: Cambridge University Press.

Fofanov, O. B., Sidorenko, T., & Zamyatina, O. (2010). Development of professional communicative competence of IT-students through learning foreign language for specific purposes. *World Transactions on Engineering and Technology Education, 8*(1), 101-106. Retrieved from www.wiete.com.au/journals/WTE&TE/Pages/Vol.8,%20No.../16-Sidorenko-10.pdf

García Laborda, J. (2011). Revisiting materials for teaching Languages for Specific Purposes. *3L The Southeast Asian Journal of English Language Studies, 17* (1), 102-112. Retrieved from https://files.eric.ed.gov/fulltext/ED524345.pdf

García Laborda, J., & Litzler, M.F. (2015). Current approaches in teaching English for Specific Purposes. *Revista Onomázein, 31*, 38-51. Retrieved from onomazein.letras.uc.cl/Articulos/N31/31_1_Laborda.pdf

García Laborda, J., & Litzler, M.F. (2017). English for business: Student responses to language learning through social networking tools. *ESP Today, 5*(1), 91-107. Retrieved from https://files.eric.ed.gov/fulltext/ED574879.pdf

Hu, Z., & McGrath, I. (2011). Innovation in higher education in China: Are teachers ready to integrate ICT in English language teaching?. *Technology, Pedagogy and Education*, *20*(1), 41-59. doi: 10.1080/1475939X.2011.554014

İnce, M. N. (2017). The analysis of EFL teachers' perceptions of CALL and variables influential on teachers' attitudes. *Journal of Narrative and Language Studies, 5*(8), 59-72. Retrieved from www.nalans.com/index.php/nalans/article/view/49

Jarvis, H. (2009). Computers in EAP: change, issues and challenges. *Modern English Teacher, 18*(2), 51-54. Retrieved from usir.salford.ac.uk/11266/1/METHJ2009.pd

Jarvis, H., & Pastuszka, L. (2008). Electronic literacy, reading skills and non-native speakers: issues for EAP. *CALL-EJ Online, 10*(1). Retrieved from http://callej.org/journal/10-1/jarvis.html

Jeong, S., Shin, W. S., & Park, I. (2015). Students' use of notebook computers in the college classroom: benefits and pitfalls. *Educational Technology International*, *16*(1), 31-57. Retrieved from www.kset.or.kr/eti_ojs/index.php/instruction/article/view/33/pdf_8

Khosravani, M., & Khoshsima, H. (2017). Investigating the Iranian EAP stakeholders' ideas apropos of applying the Internet in EAP curriculum. *International Journal of Emerging Technologies in Learning, 12*(11), 53-62. Retrieved from journals.sfu.ca/onlinejour/index.php/i-jet/article/viewFile/6995/4661

Kuech, R. K., & Kimball, W. H. (2003). Preparing teachers for assistive technology using online learning: A descriptive study. *The Journal of Interactive Online Learning*, *1*(3). Retrieved from http://www.ncolr.org/

Langan, D., Schott, N., Wykes, T., Szeto, J., Kolpin, S., Lopez, C., & Smith, N. (2016). Students' use of personal technologies in the university classroom: Analysing the perceptions of the digital generation. *Technology, Pedagogy and Education*, *25*(1), 101-117. doi: 10.1080/1475939X.2015.1120684

Li, G., & Ni, X. (2011). Primary EFL teachers' technology use in China: Patterns and perceptions. *RELC Journal, 42*(1), 69-85. doi: 10.1177/0033688210390783

Li, Y., & Wang, L. (2016). English for academic purposes: A new perspective from multiple literacies. *World Journal of English Language, 6*(2), 10. Retrieved from www.sciedu.ca/journal/index.php/wjel/article/download/9409/5839

Lida, S., Paola, C., Eva, U., & Verónica, E. (2017). Exploring the use of technology in EFL teaching: A case study of primary education in the south region of Ecuador. *Teaching English with Technology*, *17*(2), 77-86. Retrieved from https://files.eric.ed.gov/fulltext/EJ1140683.pdf

Maszkowska, N. (2017). The use of technology in English language teaching. Retrieved from http://englishcontext.kpnu.edu.ua/2017/04/18/the-use-of-technology-in-english-language-teaching.

Miller, L., Hafner, C. A., & Fun, C. N. K. (2012). Project-based learning in a technologically enhanced learning environment for second language learners: Students' perceptions. *E-Learning and Digital Media, 9*(2), 183-195. doi: 10.2304/elea.2012.9.2.183

Mustafina, A. (2016). Teachers' attitudes toward technology integration in a Kazakhstani secondary school. *International Journal of Research in Education and Science, 2*(2), 322-332. Retrieved from https://files.eric.ed.gov/fulltext/EJ1105117.pdf

Nila, N. N. (2013). Implementation of CALL in the EFL classroom: teachers' perspective and attitudes in developing CALL-based classroom. *Unpublished doctoral dissertation*, BRAC University.

Onsoy, S. (2004). Students' and teachers' attitudes towards the use of computer-assisted language learning at the preparatory school of Celal Bayar University. *Unpublished Master' s Thesis.* Bilkent University Institute of Social Sciences, Ankara.

Plastina, A. F. (2003). CALL-ing EAP Skills. Teaching English with Technology, 3(3)16-30. Retrieved from www.yadda.icm.edu.pl

Rock, T., & Passe, J. (2004). Technology integration at the university level: An analysis of an elementary social studies methods course. *Contemporary Issues in Technology and Teacher Education*, *4*(3), 313-322. Retrieved from https://www.learntechlib.org/p/19955/

Qi Dong, J. (2009). User acceptance of information technology innovations in the Chinese cultural context. *Asian Journal of Technology Innovation, 17*(2), 129-149. doi: 10.1080/19761597.2009.9668676

Scherer, R., Tondeur, J., Siddiq, F., & Baran, E. (2018). The importance of attitudes toward technology for pre-service teachers' technological, pedagogical, and content knowledge: Comparing structural equation modeling approaches. *Computers in Human Behavior, 80*, 67-80. doi: 10.1016/j.chb.2017.11.003

Teo, T. (2011). Influence of user characteristics on teachers' intention to use technology: Some research evidence. *International Journal of Instructional Media, 38*(2). Retrieved from https://dl.acm.org/citation.cfm?id=2305236

Usta, E., & Korkmaz, Ö. (2010). Pre-service teachers' computer competencies, perception of technology use and attitudes toward teaching career. *Journal of Human Sciences, 7*(1), 1335-1349. Retrieved from www.j-humansciences.com

Wang, L., & Coleman, J. A. (2009). A survey of Internet-mediated intercultural foreign language education in China. *ReCALL, 21*(1), 113-129. Retrieved from https://pdfs.semanticscholar.org/8f37/96d5f3431afb6905e556f12e6447ecbb10ef.pdf