

SOLVING ESP PROBLEMS: STUDENTS AND TEACHERS' PERCEPTIONS OF INTEGRATING INFORMATION AND COMMUNICATION TECHNOLOGY INTO ESP INSTRUCTION

Bahareh Keshtiarast, *Hadi Salehi, Omid Tabatabaei & Roya Baharlooie

English Department, Najafabad Branch, Islamic Azad University,
Najafabad, Iran.

*Corresponding author: hadisalehi1358@yahoo.com

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ABSTRACT

Background and Purpose: English for Specific Purposes (ESP) instruction in Iran is still mostly focused on traditional ways. This study aims to investigate ESP teachers' and students' perceptions of integrating Information and Communication Technology (ICT) in ESP instruction to solve traditional ESP instruction problems in Iran.

Methodology: This concurrent parallel mixed method study investigated students' and teachers' perceptions of solving ESP instruction problems through ICT. The sample concluded 300 undergraduate engineering students and 24 experienced and novice ESP teachers. In the quantitative phase of the study, data were collected through two adapted questionnaires. In the qualitative phase, data were obtained from interviews with 12 undergraduate students, three experienced, and three novice ESP teachers.

Findings: The findings revealed that the participants had positive perceptions of integrating different ICT tools for solving the problems with traditional ESP materials and methods, problems with low language skills, lack of autonomy, demotivation problem, inactivity problem, and problems with lack of exposure to real-life situations. The findings also showed that integrating

different ICT tools and ICT-based interactive activities promote students' communication skills subconsciously through experiencing direct participation in communications.

Conclusion and Contributions: The findings might contribute significantly to change the ESP instruction status quo in Iran, which is not based on the ESP students' communication needs, and replace it with innovative approaches to meet the needs of the modern ESP student. The results also provide a unique outlook of promoting ESP instruction in tertiary education by integrating ICTs through divergent stakeholder perceptions.

Keywords: English for Specific Purposes (ESP), Information and Communication Technology (ICT), Perception, Promoting English for Specific Purposes instruction

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1.0 INTRODUCTION

It has been long established that ESP objective is preparing learners to utilize English in academic or professional environments. Considering the ESP objectives, the traditional ESP instruction cannot meet the students' communication needs, such as practical needs and academic needs in the future. Along the same lines, the results of studies in non-English-speaking contexts indicated that graduate students deal with problems and unmet needs in high-level English communication skills (Lee & Lee, 2018).

In the Iranian context, ESP students and teachers deal with boredom, inactivity, low proficiency level, over-crowded classes, demotivated students, difficulty in communication, having no opportunity to use language in daily life, and inordinate use of translation activities (Barjesteh & Shakeri, 2013). Additionally, since all forms of education, including higher education, are challenged and reformed by technology (Ahmad, Kamba, & Usman, 2012), it is required to integrate ICT in ESP instruction to solve its problems and to reform the traditional ESP instruction of the tertiary-level Iranian students. In so doing, different ICT tools such as mobile learning or m-learning (Kirovska-Simjanoska, 2017), and corpus (Fuentes, 2015) need to be

included in ESP instruction. Despite the importance of ICT integration in ESP and the importance of the above-mentioned ESP instruction problems, there remains a paucity of evidence (Lee & Lee, 2018) on promoting ESP instruction through exploring different ICT tools to solve the ESP instruction problems. Motivated by this need, the aim of this study was to explore experienced ESP teachers, novice ESP teachers, and students' perceptions of integrating ICT tools in ESP instruction to solve all of these ESP instruction problems in Iran.

The results of this study have beneficial implications for ESP practitioners, ESP decision makers, and ESP material developers. Capturing the perceptions of students, and experienced and novice ESP teachers may enhance acceptance of new ESP teaching and learning methods. Furthermore, the study offers some important insights into changing the traditional ESP instruction method in Iran through integrating new ESP approach and ICT-based interactive activities.

2.0 LITERATURE REVIEW

2.1 Solving Problems with Traditional ESP Materials and Methods

The Internet materials such as podcasts, video sharing websites, blogs for ESP, e-dictionaries, Wikipedia, m-learning, concordancers, translators and encyclopedias can provide teachers with audiovisual and content to upgrade, adapt and develop materials for their ESP courses (Laborda, 2011). Moreover, employing ICT tools such as the Internet provides a “virtual staffroom” (Arnó-Macià, 2012) for ESP teachers to collaborate with field-specific specialists and other colleagues in many parts of the world. They can also easily access to different multimedia ESP materials to design materials that meet the students' needs (Arnó-Macià, 2012). The Internet has also facilitated teachers' use of up-to-date teaching methods and techniques (Kerkeb, 2018).

2.2 Solving Problems with Low Language Skills

Some empirical studies have also reported the importance of ICT tools such as wiki (Rodriguez-Arancon & Calle-Martinez, 2014) and corpus (Lenders, 2008; Poole, 2011) in developing the language skills of ESP students. Furthermore, ICT tools also promoted ESP students' speaking and listening skills and satisfied their needs in these two skills. According to Laborda (2011), reading can be problematic on mobile devices, but cellular phones are superb for speaking and listening activities. Mobile phones through connecting to the Internet can employ podcasts.

2.3 Solving Problems with Lack of Autonomy

Karsenty, Arcavi, and Hadas (2007) listed common characteristics of English learning for most vocational students, including a) lack of learning strategies, b) frustration, c) lack of confidence, d) low level of motivation, and e) unwillingness to participate. Although self-directed learning and autonomy are important in ESP, technical or vocational colleges students are not autonomous and do not take responsibility for their own English learning (Kessler, 2009). To develop learner autonomy in ESP instruction, ICTs such as CMS (Hirata & Hirata, 2012), and LMS (Kuzmina & Golechkova, 2012) can be employed. For example, Crnjac-Milic, Martinovic, and Fercec (2009) conducted a study on employing LMS in ESP course through questionnaire, observation, and test. The findings revealed that employing the LMS facilitated presenting learning materials between the institutions and students, and positive attitudes toward employing LMS in ESP instruction from teachers and students. In fact, the above-mentioned studies provide important insights into promoting ESP instruction through different ICT tools, such as LMS, CMS and blogs, to solve ESP students' problems, e.g., lack of autonomy in taking responsibility for their English learning.

2.4 Solving Demotivation Problem

Kerkeb (2018) lists five advantages of using social media in ESP instruction. First, "ESP learners can, for example, find as many native speakers as they want and learn with them English in any specific context they want" (p. 86). Second, social media helps teachers and students find co-creation and collaborative learning opportunities worldwide. Third, social media provides an effective platform for increasing the reasoning and expression power by involving students in discussions conducted on discussion forums. Fourth, social media facilitates assessment, deep understanding, use of knowledge in new contexts, and exploring creative solutions to life challenges. Last but not least, social media shifts learners' motivational orientation from being extrinsically motivated to intrinsically motivated. Overall, these studies consistently indicate that employing ICT tools promote ESP instruction and solve ESP students' problems which is demotivation in ESP learning.

2.5 Solving Inactivity Problem

Promoting involvement in ESP students and solving the problem of ESP students that is unwillingness to be engaged can be conducted through employing different ICT tools (Wheeler,

Yeomans, & Wheeler, 2008). For example, Rodriguez- Arancon and Calle-Martinez (2014) found that through employing wiki-based activities the students had active participation and were highly motivated. Similar to wikis, blogs have been widely researched in the field of ESP. Nearly all the studies support the notion that using blogs in ESP and EAP instruction can have beneficial results for academic English learning (Dashtestani & Stojcovic, 2015). Montero-Fleta and Perez-Sabater (2014) explored that employing blogging motivated students to feel as the members of a learning community. Blogging also increased participating and engaging in students. Similarly, Nicolaou and Constantinou (2014) examined employing blog in EAP instruction. Students showed positive attitudes towards employing blogs and they perceived that their collaboration increased in the class through incorporating blogs.

2.6 Solving the Problems of Lack of Exposure to Real Situations

According to Kerkeb (2018), “ESP learners, mainly NNS need to be exposed to the language through real situations such as listening to the native speakers, but also they need to use this language in writing and in face-to-face interactions” (p. 78). ICT tools can facilitate ESP students’ exposure to the language and satisfy their needs. As Kern (2013) pointed out, “the more interesting uses of mobile technology (for ESP student) will be ... 1) for simulations of real work situations and 2) for accessing learning material, podcasts, and Internet resources, wherever students happen to be and whenever they want” (p. 109). In light of the above-mentioned explanations, this study proposed different perceptions of ICT integration in ESP. This study aimed to find solutions to promote ESP instruction through different ICT tools focusing on students’, and experienced, and novice teachers’ perceptions. To this aim, three research questions were posed as follows.

1. What are the students’ perceptions of solving ESP instruction problems through ICT integration?
2. What are the experienced ESP teachers’ perceptions of solving ESP instruction problems through ICT integration?
3. What are the novice ESP teachers’ perceptions of solving ESP instruction problems through ICT integration?

3.0 METHOD

3.1 Research Design

Exploring various ICTs that solve ESP instruction problems for students and teachers requires quantitative and qualitative data analysis to gain a more comprehensive understanding. Therefore, a concurrent parallel mixed-methods design was used since such design helps better understand research problems and questions (Creswell, 2014). To provide a clear understanding of the flow of the study, a figure showing a concurrent parallel designed proposed by Creswell (2014) is presented as follows:

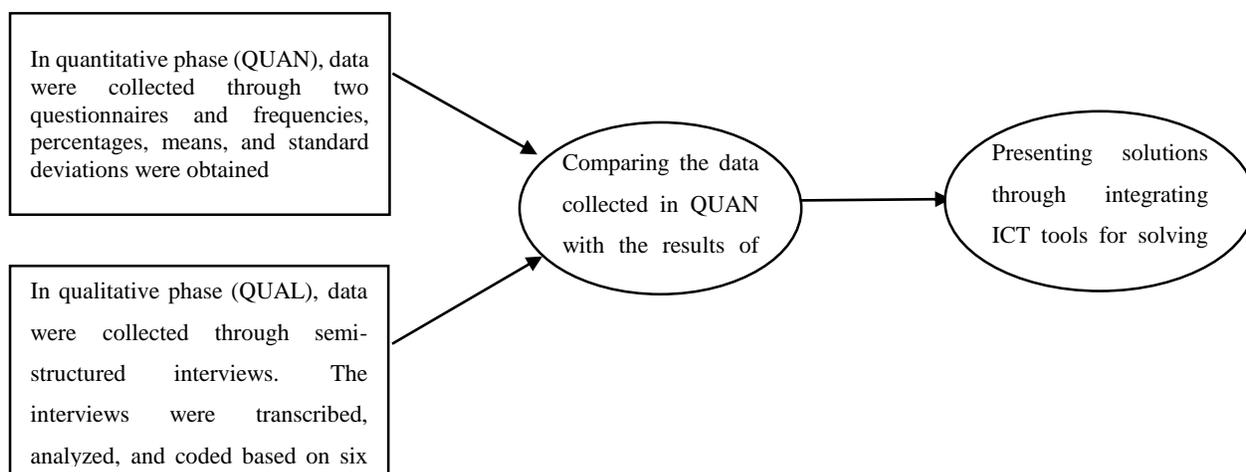


Figure 1: Convergent parallel mixed methods

3.2 Participants

3.2.1 Teacher Participants

Non-probability purposive sampling based on the teachers' expertise and experience was employed to select TEFL experienced teachers, TEFL novice teachers, subject novice teachers, and subject experienced teachers. Teacher participants were 28 ESP teachers (14 subject teachers and 14 TEFL teachers) who had experience in ESP teaching in universities in Isfahan, Iran. Semi-structured interviews were also conducted with one experienced subject teacher, two experienced TEFL teachers, two novice subject teachers, and one novice TEFL one. Before the interviews, the researchers prepared an invited email including greeting, noting the time that they should return their responses to the researcher, and researchers' contact information. The invited emails were sent to nine TEFL teachers (both experienced and novice teacher) and 27 content teachers (both

experienced and novice teachers). Out of 36 requests, two experienced TEFL teachers, one novice TEFL teacher, one experienced content teacher, and two novice content teachers eagerly responded the invited email. The demographic characteristics of teachers are presented below:

Table 1: Demographic characteristics of the teacher participants in interviews

Teacher pseudonym	Degree	Gender	Academic ranks	University pseudonym	Age	Experience in ESP teaching
ET1	PhD in TEFL	Male	Assistant professor	U4	36	11
ET2	PhD in TEFL	Female	Assistant professor	U1	38	10
NT3	PhD in TEFL	Female	Assistant professor	U3	35	2
ET4	PhD in mechanical engineering	Male	Assistant professor	U1	43	17
NT5	PhD in industrial engineering	Female	Assistant professor	U3	37	8
NT6	PhD candidate in electrical engineering	Male	Instructor	U2	41	3

Note. ET=experienced teacher, NT=novice teacher

3.2.2 Student Participants

A total number of 300 undergraduate students in engineering majors, including 190 males and 110 females, were selected by convenience sampling from universities of Isfahan province, Iran. They either enrolled in the ESP course or had passed this course. Furthermore, purposive sampling was also employed to select students with different majors and different levels of proficiency in using ICT tools to participate in the interviews. Focused group interviews were conducted with 12 students from the same sample, who were selected purposively and equally divided into two groups. The students' demographic characteristics are shown below.

Table 2: Demographic characteristics of the student participants in focused group interviews

Student Pseudonym	Major	Gender	University Pseudonym	Proficiency in Using ICT tools
St1	Computer	Female	U1	Proficiency
St2	Computer	Male	U1	Mediocre
St3	Biomedical	Female	U1	Mediocre
St4	Biomedical	Female	U1	Little
St5	Electrical	Male	U1	Proficiency
St6	Electrical	Female	U1	Proficiency
St7	Material	Male	U2	Little
St8	Material	Male	U2	Proficiency
St9	Civil	Male	U2	Little
St10	Civil	Male	U2	Mediocre
St11	Mechanic	Female	U2	Little
St12	Mechanic	Female	U2	Mediocre

Note. St1= student, U=university

3.3 Instrument

3.3.1 Questionnaire

The items of the two questionnaires were adapted from review of previous empirical studies concerning the integrating ICT and technology in ESP instruction, professionalizing ESP, and promoting ESP instruction problems (Barjesteh & Shakeri, 2013; Dashtestani & Stojkovic, 2015; Karsenty et al., 2007; Kerkeb, 2018). They were piloted in a two-step process to check their reliability and validity.

First, content, face, and construct validity of the questionnaires were checked by five ESP experts, including three TEFL and two subject professors. The key terms, including ICT, wiki, etc., were defined in the initiation part of the questionnaires to ensure that participants know them. Second, the questionnaires were piloted with 30 undergraduate engineering students, three subject teachers, and three TEFL teachers who were not in the sample of the study. Based on the participants' questions about ambiguous items, four items were marked and edited.

The final version of teachers' ($\alpha=0.89$) and students' questionnaires ($\alpha =0.77$) comprised 16 and 17 statements, respectively, focusing on solving ESP instruction problems by ICTs. Each questionnaire consisted of two parts. The demographic information of teachers and students were

elicited in the first sections of the questionnaires. The second section consisted of six themes probed into the participants' perceptions of solving ESP instruction problems through different ICTs. These themes were: (1) Solving Problems with Traditional Materials and Methods; (2) Solving Problems with Low Language Skills; (3) Solving Problems with Lack of Autonomy; (4) Solving Demotivation Problem; (5) Solving Inactivity Problem; and 6) Solving the Problems of Lack of Exposure to Real-Life Situations.

3.3.2 Semi-Structured Interview

The second instrument was an interview protocol developed for conducting semi-structured interviews with teachers and students. The interview questions were designed based on questionnaires. At the beginning of the interviews, two ice-breaking questions related to participants' knowledge of ICT abbreviations and tools were posed, then 12 probing questions and their sub-questions were asked. Two questions in the first section, i.e., Solving Problems with Traditional Materials and Methods, elicited the participants' perceptions of employing different Internet materials for promoting traditional ESP materials. Four questions in the second section of the interview, i.e., Solving Problems with Low Language Skills, were related to improving the reading, listening, writing, and speaking through wiki, corpus, SNS, and m-learning. Two questions in the third section, i.e., Solving Problems with Lack of Autonomy, inquired the participants' beliefs about integrating CMS, LMS, and blog in ESP instruction to solve the problems with lack of autonomy in this course. One question and its sub-questions in the fourth section, i.e., Solving Demotivation Problem, aimed to find the participants' perceptions of utilizing SNS and m-learning to solve demotivation problem. One question and its sub-questions in the fifth section, i.e., Solving Inactivity problem, aimed to explore solving inactivity problem through employing online discussion forums, SNS, wikis, and blogs in ESP course. Two questions in the last section, i.e., Solving the Problems of Lack of Exposure to Real-Life Situations, elicited the perceptions of implementing interactive and communicative activities through ICTs for solving the lack of exposure to real situations in ESP instruction. In addition, one closing question was added to elicit the information not found by previous interview questions.

3.4 Procedure

3.4.1 Quantitative Phase

Before conducting the study, the questionnaires were piloted in two stages. Firstly, the format and comprehensibility of the questionnaire items, congruence between items and purpose of study, and wording of statements were revised based on the comments of five experts. Secondly, before distributing questionnaires, the initial versions of questionnaires were piloted with 30 students, five subject and five TEFL who were not sampled in the study. The final versions of the questionnaires were translated through the back translation procedure from English into Persian by two experts in translation. Next, the teacher and student questionnaires were distributed to the participants during their class break. This phase of the study took approximately 15 minutes for each participant. To address the ethical issues before data collection, the participants read and signed the consent form.

3.4.2 Qualitative Phase

The interview questions, wording, and format were initially validated based on the comments of EFL experts and the number of interview questions reduced. In addition, a pilot study was conducted with participants to revise and modify interview questions. The Persian translation of interview questions was developed by the back translation procedure.

For ethical considerations, the consent form was signed by the participants. Moreover, to protect interviewees' anonymous participation, pseudonyms were assigned to them. The interview session was held with teacher participants at their offices and took one hour for each teacher.

During focus group interviews, students discussed the interview questions with one another. For this study, the researcher used the focus-group interview that allowed students to discuss their ideas and feel more relaxed than holding in-person interviews. Interviewing each group of students lasted approximately one hour. Member checking and peer debriefing were used to ensure the accuracy and trustworthiness of findings of this qualitative phase of the study.

3.5 Data Analysis

Data analysis was carried out in quantitative and qualitative phases. In the quantitative phase, means and standard deviations were reported for each item of the questionnaires using SPSS. The

second phase involved analyzing the qualitative interview data. The audio recordings of the interview sessions were transcribed and analyzed.

First, the obtained raw data were transcribed and translated, and analyzed through constant comparative analysis to obtain the themes (Glaser & Strauss, 1967). Next, the coding process was started. Two coders who were experts in doing qualitative studies coded the interview data and proposed the common themes. Third, each transcript was read repeatedly to find ideas, then the ideas and thoughts were written as a word in the margin of each transcript (Cresswell, 2014). More specifically, the interview transcriptions were analyzed and coded based on six themes in this study. The transcripts were coded into 30 codes. Fourth, after reading the codes several times, the repetitive codes were removed. Therefore, the codes reduced to 15 and were matched into three predetermined themes. Indeed, once the primary themes were determined, two experts in doing qualitative studies checked the coding more analytically. After terminating the initial analytical coding, broader categories emerged. Emergent categories were adjusted throughout the analysis process until they were refined to best present the data. A coding consistency of 0.85 was achieved.

4.0 RESULTS

4.1 Quantitative phase

4.1.1 Solving ESP Instruction Problems through ICTs: Students' Perceptions

The first research question of the study addressed solving ESP instruction problems through different ICT tools. The results for each group of participants are presented in the following:

Table 3: Students' solutions for the ICT integration

Statements	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Mean
1. Integrating ICT tools in ESP instruction promotes traditional materials by providing different materials to increase students' knowledge of genres related to their majors.	76	118	54	34	18	3.66
2. ESP materials should include listening activities and different websites extracted from the update resources in the Internet which currently used in the students' profession.	74	156	35	26	9	3.86
3. To solve the problems with traditional ESP materials, ICT integration in ESP instruction provides more opportunities for more professional materials development.	57	136	45	39	23	3.55
4. To satisfy the ESP student needs and solve ESP instruction problems, such as low writing proficiency, ICT tools can be used.	70	115	56	41	18	3.59
5. To satisfy ESP student needs and solve ESP instruction problems, such as low reading proficiency, ICT tools such as wiki can be used.	55	125	54	44	22	3.49
6. To satisfy the ESP student needs and solve ESP instruction problems, such as difficulty in communication, social network sites can be used.	69	160	41	20	10	3.86
7. To satisfy ESP student needs and solve ESP instruction problems, such as low speaking and listening proficiency, m-learning is useful.	75	159	35	19	12	3.88
8. To promote students' communication skills, such as interaction with native experts in their major, ICT tools can be used.	58	153	50	23	16	3.71
9. To solve the ESP instruction problems, lack of ESP learning strategies, ICT tools enable students to use suitable learning strategies that lead to independent learning.	62	115	66	43	14	3.56
10. To solve the ESP student problems, such as lack of autonomy, ICT tools can be employed to enable ESP students to experience autonomous learning.	75	117	58	32	18	3.66

11. To solve the ESP student problems, such as demotivation, ICT tools can be used to promote student engagement and motivation.	60	159	40	32	9	3.76
12. To solve the ESP instruction problems, e.g., frustration and demotivation, integrating ICT in ESP instruction help students in constructing knowledge and in engaging without being frustrated.	56	118	81	30	15	3.56
13. To solve the ESP student problems, such as inactivity, ICT tools can promote participation and collaborative learning.	71	125	54	32	18	3.66
14. Promoting ESP instruction could be achieved through implementing interactive activities on professional issues related to students major.	69	125	46	43	17	3.62
15. In promoting ESP instruction through interactive activities, acquisition occurs due to students' experiencing direct participation in professional communication.	63	128	45	44	20	3.56
16. In promoting ESP instruction through interactive activities, professional communication skills are subconsciously constructed by the students in experiencing the communication.	70	119	59	34	18	3.63
17. To promote international communication and collaboration in ESP instruction, communicative activities can be conducted on ICT tools.	65	121	45	48	21	3.53

The mean scores of all the questionnaire items were above 3.00, which is the average value of the choices, i.e., students concurred with all the proposed solutions. They were more specifically in agreement with items 7 ($M = 3.88$), 2 ($M = 3.86$), 6 ($M = 3.86$), and 8 ($M = 3.71$).

4.1.2 Solving ESP Instruction Problems through ICTs: Experienced and Novice Teachers' Perceptions

The solutions rated by experienced and novice teachers are presented in Table 4.

Table 4: Experienced and novice teachers' solutions for the ICT integration

Statements	Teacher	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Mean
1. Integrating ICT tools such as the Internet in ESP instruction promotes traditional materials by providing different materials to increase students' knowledge of genres related to their majors.	Experienced	4	8	1	1	0	4.07
	Novice	4	10	0	0	0	4.28
2. To solve the problems with traditional ESP materials, ICT integration in ESP instruction provides more opportunity for teachers to create more professional materials.	Experienced	3	9	2	0	0	4.07
	Novice	4	9	0	1	0	4.14
3. To solve the problems with traditional ESP materials, ICT tools can be employed to provide ESP teachers with audiovisual materials.	Experienced	3	11	0	0	0	4.21
	Novice	6	8	0	1	0	4.26
4. To satisfy the ESP student needs and solve ESP instruction problems, such as low writing proficiency, ICT tools can be used.	Experienced	2	7	4	1	0	3.71
	Novice	2	8	2	2	3	3.71
5. To satisfy ESP student needs and solve ESP instruction problems, such as low reading proficiency, ICT tools can be used.	Experienced	1	10	1	2	0	3.71
	novice	2	11	1	1	0	4.07
6. To satisfy the ESP student needs and solve ESP instruction problems, such as difficulty in communication, social network sites can be used.	Experienced	5	7	1	1	0	4.14
	Novice	3	11	0	0	0	4.21
7. To satisfy ESP student needs and solve ESP instruction problems, such as low speaking and listening proficiency, m-learning is useful.	Experienced	4	8	2	0	0	4.14
	Novice	9	5	0	0	0	4.64

8. To promote students' communication skills, such as interaction with native experts in their major, ICT tools can be used.	Experienced	5	7	2	0	0	4.21
	Novice	6	8	0	0	0	4.42
9. To solve the ESP student problems, such as lack of autonomy, ICT tools can be employed to enable ESP students to experience autonomous learning.	Experienced	3	8	1	2	0	3.85
	Novice	5	8	1	0	0	4.29
10. To solve the ESP student problems, such as demotivation, ICT tools can be used to promote student engagement and motivation.	Experienced	3	10	0	1	0	4.07
	Novice	6	8	0	0	0	4.42
11. To solve the ESP instruction problems, e.g., frustration and demotivation, integrating ICT in ESP instruction help students in constructing knowledge and in engaging without being frustrated.	Experienced	4	8	1	1	0	4.07
	Novice	4	8	1	1	0	4.07
12. To solve the ESP student problems, such as inactivity, ICT tools can promote participation and collaborative learning.	Experienced	3	7	2	2	0	3.78
	Novice	8	6	0	0	0	4.57
13. Promoting ESP instruction could be achieved through implementing interactive activities on professional issues related to students major.	Experienced	2	10	1	1	0	3.92
	Novice	7	6	1	0	0	4.42
14. In promoting ESP instruction through interactive activities, acquisition occurs due to students' experiencing direct participation in professional communication.	Experienced	3	8	2	1	0	3.92
	Novice	7	7	0	0	0	4.50
15. In promoting ESP instruction through interactive activities, professional communication skills	Experienced	4	8	1	1	0	4.07

are subconsciously constructed by the students in experiencing the communication.	Novice	7	7	0	0	0	4.50
16. To promote international communication and collaboration in ESP instruction, communicative activities can be conducted on ICT tools.	Experienced	3	8	2	1	0	3.92
	Novice	4	9	1	0	0	4.21

Experienced teachers also showed their agreement with all the listed solutions in Table 4 since all the mean scores of the questionnaire items were above 3.00. Among those solutions, the experienced teachers tended to agree more with the solutions put forward in items 3 ($M = 4.21$), 8 ($M = 4.21$), 6 ($M = 4.14$), and 7 ($M = 4.14$).

For novice teachers, they agreed with solutions such as the ones brought up in items 7 ($M = 4.64$), 12 ($M = 4.57$), 14 ($M = 4.50$), and 15 ($M = 4.50$). Table 5 presents the results of a one-sample t test, which was run to test the extent to which the participants agreed with the proposed solutions.

Table 5: One-sample t test for solutions to ICT implementation

Test Value = 3						
	t	df	Overall Mean	$Sig.$ (2-tailed)	95% Confidence Interval of the Difference	
					Lower	Upper
Students	22.25	16	3.65	.00	.59	.71
Experienced Teachers	24.01	15	3.99	.00	.90	1.07
Novice Teachers	23.27	15	4.30	.00	1.18	1.42

In sum, the participants in this study agreed with the proposed solutions to a level that reached statistical significance.

4.2 Qualitative Phase

The interview data are presented in this section.

4.2.1 Solving ESP Instruction Problems through ICTs: Students' Perceptions in Focused Group Interviews

The majority of the students reported that ICT tools could solve ESP problems such as lack of exposure to real-life and demotivation. The most ESP instruction problem recounted by ten participants was the lack of exposure to real-life situations. They believed that integrating m-learning in ESP instruction solves this problem. Comments seemed to describe the participants' thoughts on employing m-learning for ESP learning to simulate real work situations by interacting with natives. For example, St6, agreeing with St11 and St8, explained that *"we can expose to real language through simulating professional situation with native friends by mobile or laptop"*. St3 pointed out that *"I work in one company. While I continue my education, I can use mobile everywhere for ESP learning through checking e-dictionary, listening to sharing authentic audios"*. The view of solving the problem of lack of exposure to real-life situations by mobile, tablet, and laptop was expressed many times during the interview (by St1, St2, St7, St12). The second problem of ESP instruction reported by participants was demotivation. Most of their responses indicated that social network sites (SNSs) provide interactive and real-life activities that foster their intrinsic motivation. For example, St1 stated:

ESP class is desperately boring. In my opinion, SNSs inspire me to learn ESP rather than only pass the course. They increase my intrinsic motivation. I have access to my teacher and professional experts in my discipline through different forums, LinkedIn, Research gate.

The students' also referred to the following ICT tools for solving ESP instruction problems:

- 1) Integrating the Internet and mobile provide authentic and realistic activities that meet our future needs and solve the problems with traditionally ESP materials and out-of-date ESP methods. (St1, St4, St5, St6, St8, St9)*
- 2) Mobile can help use improve our listening skills since we can authentic audio and video materials by mobile. (St10, St1, St6, St2, St3, St4)*
- 3) Blog, SNSs, LMS can increase participation and collaboration in ESP instruction. (St1, St4, St5, St6, St9, St11)*

As Table 6 indicates, students had positive perceptions of this integration. Solving the ESP problems which were reflected in the focused group interviews included solutions for problems with traditional ESP materials and methods, solutions for problems with low language skills, solutions for problems with lack of autonomy, solutions for demotivation problem, solving inactivity problem, and solving the problems of lack of exposure to real situations.

Table 6: Interview results for students' perceptions of solving ESP instruction problems

Themes	Students	Responses	Categories
Solving Problems with Traditional ESP Materials and Methods	St1, St4, St5, St6, St8, St9	<i>Integrating the Internet and mobile provide authentic and realistic activities that meet our future needs and solve the problems with traditionally ESP materials and out-of-date ESP methods.</i>	Providing authentic activities through mobile and the Internet Providing realistic activities Meeting students' future needs
Solving Problems with Low Language Skills	St10, St1, St6, St2, St3, St4	<i>Mobile can help use improve our listening skills since we can use authentic audio and video materials by mobile.</i>	Improving listening skill with mobile
Solving Problems with Lack of Autonomy	St3	<i>We can use the corpus to increase our technical vocabulary learning because we can independently check and revise our writing.</i>	Revising writing independently

Solving Demotivation Problem	St1	<i>SNSs inspire me to learn ESP rather than only pass the course. They increase my intrinsic motivation. I have access to my teacher and professional experts in my discipline through different forums, LinkedIn, Research gate.</i>	Inspiring ESP learning through SNSs Increasing intrinsic motivation through SNSs Accessing to teachers and professional experts
Solving Inactivity Problem	St1, St4, St5, St6, St9, St11	<i>Blog, SNSs, LMS can increase participation and collaboration in ESP instruction.</i>	Increasing participation through blog, SNSs, LMS
Solving the Problems of Lack of Exposure to Real Situations	St1, St2, St7, St12, St6, St8, St11	<i>We can expose to real language through simulating professional situation with native friends by mobile or laptop.</i>	Exposing to real language Simulating professional situation with native by using mobile

4.2.2 Solving ESP Instruction Problems through ICTs: Experienced Teachers' Perceptions

All experienced teachers reported that employing ICT tools could solve the problem with traditional ESP materials and methods. For example, ET4 explained:

Real-life activities and authentic materials could be presented through websites, blog, wiki, mobile, video, and audio to simulate real use of the course [ESP] that makes activities and materials usable for the students' future goals. Through the Internet, teachers can access update techniques and materials for their ESP teaching.

Talking about employing different ICT tools in solving ESP problems, such as low language proficiency, an interviewee said that “we can send the audio files through mobile and ask students to listen and transcribe them or discuss them to improve their language skills” (ET2).

There were some negative comments about the disadvantages of mobile and the Internet in the class. For example, ET2 said that “using mobiles in the class has some disadvantages such as

disconnection, distraction, lack of supporting all type of materials by all mobiles.” When the experienced ESP teachers were asked about solving ESP problems through ICT-based ESP instruction, most of them stated that inactivity problem could be solved through ICTs in ESP learning. For example, ET4 exemplified different ICT tools for solving inactivity problem in ESP:

I let my students use mobile in the ESP class to solve inactivity. I permit them to use mobile to search the net, Wikipedia, and e-dictionaries, SNSs. Therefore, I let them use their mobile to challenge and involve them in meaningful learning, not memorizing.

When the experienced teachers were asked about the problem of lack of exposure to real situations, most of them agreed that ICT-based interactive activities solve this problem. ET4 exemplified his experience of implementing ICT-based interactive and real life activities such as role-playing and simulated professional situations in his ESP class through ICTs:

I provide many interactive activities such as searching on the net, writing email to experts, writing and adding texts in wiki, presenting video clip of my PhD defense on Nanocomposites for discussion and for showing real situation.

The last ESP problem mentioned by experienced teachers which could be solved by incorporating ICT tools was the lack of autonomy. For example, ET1 noted that *“this is a good idea because students can control and take charge of their ESP learning. They have access to different authentic audience and materials and ICTs”*. These ideas illustrate that integrating ICT tools in ESP promotes autonomy and enables ESP students to monitor their learning. The themes obtained from the interviews with experienced teachers are presented below.

Table 7: Interview results for experienced teachers' perceptions of solving ESP instruction problems

Themes	Experienced teachers	Responses	Categories
Solving Problems with Traditional ESP Materials and Methods	ET4	<i>Real-life activities and authentic materials could be presented through websites, blog, wiki, mobile, video, and audio to simulate real use of the course [ESP] that makes activities and materials usable for the students' future goals.</i>	Presenting real-life activities through wiki, websites, blog, mobile, and audio/video Presenting authentic materials through wiki, websites, blog, mobile, and audio/video Simulating real use of ESP course through wiki, websites, blog, mobile, and audio/video
Solving Problems with Low Language Skills	Et2	<i>We can send the audio files through mobile and ask students to listen and transcribe them or discuss them to improve their language skills.</i>	Promoting listening skill with mobile
Solving Problems with Lack of Autonomy	ET1	<i>This is a good idea because students can control and take charge of their ESP learning. They have access to different authentic audience and materials and ICTs.</i>	Controlling and taking charge of students' ESP learning Accessing to authentic audience and material
Solving Demotivation Problem	ET1	<i>ESP teachers can use SNS and audio and video materials to share, and create up to date and authentic materials, which supplement ESP textbook for students and promote motivation.</i>	Promoting motivation through integrating SNSs

Solving Inactivity Problem	ET4	<i>I let my students use mobile in the ESP class to solve inactivity. Mostly, synonyms and definitions of special vocabulary are challenging in our major. I let them use their mobile to challenge and involve them in meaningful learning, not memorizing.</i>	Solving inactivity through using mobile Solving inactivity through searching the net, wiki, and SNSs Using mobile for involving in meaningful learning
Solving the Problems of Lack of Exposure to Real Situations	ET4	<i>I provide many interactive activities such as searching on the net, writing email to Switzerland experts, writing and adding texts in wiki, presenting video clip of my PhD defense on Nanocomposites for discussion and for showing real situation.</i>	Solving the Problems of Lack of Exposure to Real Situations through interactive activities

4.2.3 Solving ESP Instruction Problems through ICTs: Novice Teachers' Perceptions

The novice teachers referred to the following issues:

- 1) *ICT tools such as the Internet provide access to audiovisual materials. ESP teachers can design ICT-based courses. Therefore, the problem of traditional ESP materials and methods could be solved. (NT1)*
- 2) *To solve the problems with traditional ESP methods, ESP teachers can use the Internet to present different authentic materials. I use different audiovisual materials to design and develop ESP materials based on students' needs (NT5).*
- 3) *Integrating ICT tools, particularly SNS, motivates students to learn ESP. SNSs can help ESP learning by promoting speaking skills, developing positive attitudes towards language learning, and fostering motivation. (NT3, NT6)*

When the teachers were asked about their experience of using ICT tools in solving ESP instruction problems, NT5 explained his experience of integrating ICT in ESP teaching:

Holding virtual classes and collaboration of ESP students, concerning the lack of ESP students present in ESP class in PNU universities, lead to increasing collaboration and facilitation in teaching and learning ESP. (NT5)

The general results of the study revealed that most of the participants agreed significantly with solving ESP instruction problems through ICT tools to satisfy ESP students' needs in the future. Teacher and student participants on the whole demonstrated positive beliefs about solving the problems with traditional ESP materials and methods, solving the problems with low language skills, solving the problems with lack of autonomy, solving demotivation problem, solving inactivity problem, and solving the problems with lack of exposure to real-life situations through integrating ICT tools. In addition, employing update materials such as websites, videos or audio through the Internet can solve the problems with traditional materials and provide up to date methods. There were also some recommendations that ICT-based interactive activities, role-playing through mock sessions, searching on the net, writing email to native experts, writing texts in wiki, presenting video of real situations of use of language for discussion, could solve the problems with lack of exposure to real-life situations. The themes obtained from the interviews with novice teachers are presented below.

Table 8: Interview results for novice teachers' perceptions of solving ESP instruction problems

Themes	Novice Teachers	Responses	Categories
Solving Problems with Traditional ESP Materials and Methods	NT1	<i>ICT tools such as the Internet provide access to audiovisual materials. ESP teachers can design ICT-based courses. Therefore, the problem of traditional ESP materials and methods could be solved.</i>	Providing access to audio visual materials through the Internet Designing ICT-based courses
Solving Problems with Low Language Skills	NT3, NT6	<i>SNSs can help ESP learning by promoting speaking skills, developing positive attitudes towards language learning, and fostering motivation.</i>	Promoting speaking skill through SNSs

Solving Problems with Lack of Autonomy	NT3	<i>LMS, CMS, SNS, wiki, and blogs, are helpful for solving lack of autonomy in ESP classes.</i>	Solving lack of autonomy through LMS, CMS, SNS, wiki, and blogs
Solving Problem	Demotivation NT3, NT6	<i>Integrating ICT tools, particularly SNS, motivates students to learn ESP.</i>	Solving Demotivation Problem through SNSs
Solving Problem	Inactivity NT3	<i>LMS, CMS, SNS, wiki, and blogs, are helpful for solving inactivity problem.</i>	Solving Inactivity Problem through LMS, CMS, SNS, wiki, and blogs
Solving the Problems of Lack of Exposure to Real Situations	NT3	<i>I have used LMS in my ESP teaching. Because of the possibility of being connected to the net and other web-based materials and also the possibility of chatting to students, teachers can select materials and interact with students.</i>	Advantages of LMS

5.0 DISCUSSION AND CONCLUSION

With respect to the research questions of this study, no significant difference was found in the participants' perceptions of integrating ICTs, such as m-learning, to solve ESP instruction problems. These results are consistent with those of Laborda (2011), who explained that the Internet materials such as podcasts, video sharing websites, and blogs for ESP, could support teachers with audiovisual and content to upgrade, adapt and develop materials for their ESP courses.

Moreover, the results showed that the participants positively perceived having updated techniques for ESP teaching by integrating the ICT such as the Internet. This result reflects Kerkeb's (2018) study, who that the Internet provided an opportunity for ESP teachers to present up-to-date teaching methods and techniques. It can thus be concluded that the Internet materials

and interactive activities integrated with ICTs in ESP instruction solve the problems with traditional ESP materials and methods.

Concerning solving the problem with low language skills by ICTs, there was no consensus among the participants. The important ICT tools for solving this problem reported by participants were wiki, corpus, and mobile. The results of this study showed that the problem of low proficiency in writing, reading, and vocabulary could be solved by wiki. These results seem to be consistent with studies that reported the beneficial effects of the wiki in improving different language skills such as writing, reading, and vocabulary (Rodriguez-Arancon & Calle-Martinez, 2014). The participants also stated that m-learning help to improve listening and speaking skills. This idea was consistent with the one stating that cellular phones are superb for speaking and listening activities (Laborda, 2011).

Regarding solving the problem of lack of exposure to real-life, the findings suggested that ESP students' needs to communicative use of ESP could be satisfied through exposure to real-life situation in ESP instruction through m-learning. In addition, they can use mobile to access different authentic materials for ESP learning every time and everywhere. The ideas mentioned by teachers and students in this study were similar to those described by Kern (2013), who discussed the interesting uses of mobile technology for ESP students.

In addition, the results revealed that ICT-based interactive activities, such as role-playing could solve the problem with lack of exposure to real situation. A possible explanation for this might be that ESP students can experience participation in professional communication and they can construct their communication skills subconsciously through experiencing the interaction.

Moreover, the results showed that ICT tools, such as SNS, increase students' motivation and inspire them to learn ESP. Comparing this finding with that of Kerkeb (2018) reveals the advantages of employing SNSs to increase ESP motivation. In addition, the results indicated that through employing SNSs, ESP students could collaborate with their teachers or learn English by interacting with native audiences and experts at a low price through the Internet. Therefore, ICTs such as SNSs could solve the problem of demotivation in ESP instruction.

The results showed that the participants reported ICT tools such as blog solve the problem of lack of autonomy in ESP learning. These results seem to be consistent with those of the studies reported that LMS (Crnjac-Milik et al., 2009; Kuzmina & Golechkova, 2012), and CMS (Hirata & Hirata, 2012) could enable ESP students to experience autonomous learning. Comparing the

findings with those of other studies confirms that integrating different ICT tools such as SNS (Wheeler et al., 2008), wiki (Rodriguez-Arancon & Calle-Martinez, 2014), and blog (Nicolaou & Constantinou, 2014), can promote participation and collaboration. Thus, inactivity problem in ESP instruction can be solved by using ICTs.

In sum, the findings of the present study represent a significant breakthrough in the way of status quo ESP instruction and curriculum in Iranian tertiary level. Investigating the students' and experienced and novice teachers' perceptions in one study can present ESP practitioners and policymakers a comprehensive picture of solving ESP instruction problems through ICTs in the Iranian context. However, a number of important limitations need to be considered. First, employing questionnaire may be subject to social desirability bias. Some of the participants are not honest in answering the questionnaires and they try to meet the expectations of the researchers. Second, the findings are limited to the data collected from 300 engineering students and 28 ESP teachers in a city in Iran. Carrying out similar studies in this context with a larger sample size can provide more generalizable results.

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APPENDIX

An example of theme extracted from teachers' interviews

Themes	Question	Teacher	Responses
Solving Problems with Traditional ESP Materials and Methods	Do you perceive employing different Internet materials for promoting traditional ESP materials could solve problems with traditional ESP materials and methods?	ET4	<i>Real-life activities and authentic materials could be presented through websites, etc., to simulate real use of the course [ESP] that makes activities and materials usable for the students' future goals.</i>
		ET1	<i>ESP teachers can use SNS and audio and video materials to share, and create up to date and authentic materials, which supplement ESP textbook for students and promote motivation.</i>
		ET2	<i>ESP teachers can find up to date materials related to students' profession through e-books etc. They can solve the problems with traditional ESP materials through Internet, audiovisual, and multimedia materials.</i>