

The Effect of Teaching Reading Skill based on Technological Pedagogical Content Knowledge (TPACK) Principles on Iranian Payame Noor University Students' Reading Comprehension Performance

Mona Naeimzadeh Khorasani

*M.A. in TEFL, English Language Instructor in Payame Noor University, Garmsar, Iran
Educated in TEFL Department of Garmsar Branch, Islamic Azad University, Garmsar, Iran*

Abstract: The present study was an attempt to explore the effect of teaching reading skill based on TPACK principles on Payame Noor university students' reading comprehension performance. To achieve the purpose, 114 Iranian students at Payame Noor University in Garmsar, Semnan province, Iran were selected. They took Oxford Placement Test and 48 intermediate-level students were randomly assigned into two equal groups (i.e., one experimental and one control group). Then, both groups were pretested on reading to evaluate the learners' reading knowledge at the beginning of the research. During the treatment, the experimental group received reading teaching based on TPACK principles. On the other hand, there were no TPACK principles in teaching reading sections for the control group. In other words, the control groups received the reading instruction based on conventional way of teaching. At last, to become aware of the students' achievement in reading skill after the treatment, the posttest was administered to both groups. Data were analyzed through a series of independent samples *t*-test to compare the groups' scores before and after the treatment. The findings revealed that teaching reading skill based on TPACK principles did have statistically significant effects on the students' reading comprehension performance. Conversely, reading comprehension performance of the control group was not developed significantly in comparison with the experimental group. Implications of the study suggest that teaching reading skill based on TPACK principles can enhance Iranian university students' reading comprehension.

Keywords: Reading, TPACK, University Students

Introduction

The use of technology in educational system has grown to be greater prevalent lately, and has facilitated teaching and learning of both inside and out of the class. Although, no matter the proliferation of instructional technology, there are few research that investigated technology use and implementation by the inexperienced persons' overall performance. One technique towards utilizing the technology is computer-assisted language learning (CALL). It is defined as "students teaching and learning of language in any context with through technology" (Egbert, 2017, p. 34). CALL refers to "the use of a computer in the teaching or learning of a second or foreign language" (Richards & Schmidt, 2010, p. 110). CALL accommodates a wide range of facts and communications technology packages and approaches to teaching and mastering overseas languages, from the traditional drill-and-exercise curriculums that defined call within the 1960 and Seventies to more current manifestations of name, e.g., as used in a digital learning environment and net-based totally distance teaching and learning of. It additionally embraces the application of corpora and concordances, interactive whiteboards (Schmidt, 2021), language learning in virtual worlds, and mobile-assisted language learning (MALL) (Kukulka-Hulme, 2014).

In the present study, the effect of teaching reading skill based on TPACK principles on Iranian Payame Noor university students' reading comprehension was investigated. According to Schmidt, et al. (2009), TPACK refers to the knowledge required by instructors for integrating technology into their teaching in any content area. Instructors have an intuitive understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK) by teaching content using appropriate pedagogical methods and technologies. In addition, it is regarded as the encompassing framework from which an instructors' integration of the domains of CK, PK, and TK. Moreover, it is considered as the instrument measuring instructors' integration of the domains of CK, PK, and TK. Mishra (2006) introduced the TPACK framework with seven components. Three areas of knowledge are found at intersection of this framework. *Content* (C) is the subject matter, *technology* (T) is the implementation of any technology used in to teaching and *pedagogy* (P) is the collected practices, procedures, methods and approaches used while teaching that content through technology (Mishra & Koehler, 2006). These days, the issues of technology for TPACK have been highlighted in trainer improvement. Teachers' competence in incorporating technology in numerous pedagogical strategies has end up imperative in view of the

accelerating boom of technology inside the twenty-first century (Tanak, 2018). Similarly, the importance of enhancing teachers' TPACK for incorporating technology in TPD programs has been accentuated in current literature (Pareto & Willermark, 2019). The TPACK framework suggests that properly teaching calls for enhancing a best focus of the complex bonds among era, content, and pedagogy, and making use of this attention to sell pertinent, context-dependent methods and representations. Incorporating era efficaciously in educational system calls for to recall all three bodies of understanding collectively in the difficult links within the gadget defined by using the 3 key our bodies of knowledge (Mishra & Koehler, 2006).

Statement of the Problem

Some researchers such as Alhadijah, (2020), Chwo, Marek and Wu (2018), Lam, Wang and Zhao (2018), Hashemifardnia, Namaziandost and Rahimi Esfahani (2018), Khbiri and Khatibi (2013), Stockwell, (2008), Khubyari and Haddad Narafshan (2016), Rezaei Mai and Pesaranghader (2014), Khansarian-Dehkordi and Ameri-Golestan (2017), SorayyaeiAzar and Nasiri (2014), Fageeh (2013), KhademEstarki and Bazayar (2016), Najmi (2015), Jafarian, Soori and Kafipour (2012) focused on the importance of new technologies (e.g., CALL/MALL) and their effects of on developing foreign/second language learning. However, to the best the present researcher's knowledge, no research study explored the effect of teaching reading skill based on TPACK principles on Iranian Payame Noor university students' reading comprehension performance. Thus, in order to fill the gap, the present study was designed to achieve the purpose.

Research Question

Does teaching reading skill based on TPACK principles have any statistically significant effects on Iranian Payame Noor university students' reading comprehension performance?

Research Hypothesis

Teaching reading skill based on TPACK principles does not have statistically significant effects on Iranian Payame Noor university students' reading comprehension performance.

Related Studies

Tseng (2014) investigated the EFL students' perceptions of the TPACK of their instructors with the aid of administering a legitimate learner-primarily based scale. The individuals were 257 Taiwanese high college students. The findings of the look at discovered that the scholars considered their teachers to be greater capable in 3 areas of middle information than in the interfaces among them. More particularly, it became located that scholars' perceptions have been that their teachers' content information became better than their integrated TPACK. Further, the implication of this take study was that students' perceptions could be taken into account which will help practitioners in improving their era-related teaching activities.

Alijani, et al., (2014) tested the cognitive approaches, applicable factors, and advantages of using mixed-learning to know models inside KIPP (knowledge is power program) in New Orleans, Louisiana. They surveyed 186 instructors at nine colleges and confirmed that forty eight% of the respondents agreed that they believed combined learning to know was extra effective than conventional face-to-face education. Moreover, they found that ninety four% of the respondents believed that mixed studying will increase a faculty's educational fulfillment. The effects of this have study additionally indicated that the transition to a mixed-learning model benefitted college students with the aid of permitting them to study at their personal individual paces, and instructors by using permitting them to offer extended person interest while needed. This observation supports the use of mixed-mastering fashions in schools, imparting equipment to enhance scholar achievement and teacher effectiveness.

Camahalan and Ruley (2014) carried out studies focusing on the usage of blended learning of for middle college writing preparation. This study used sixteen college students. Half of those college students participated in mixed-learning to know activities and the other 1/2 obtained traditional face-to-face preparation. The scholars who participated in the former confirmed a benefit of 39.5% from the pre-take study to the publish-test, even as the students who acquired traditional face-to-face preparation confirmed a benefit of 34.25% over a -week instructional period. They discovered student mastering confirmed higher increase with the use of a combined-learning to know surroundings.

Chuang et, al. (2018) examined students' perceptions of English instructors' knowledge in managing technology-supported instructions. By utilizing a structural equation modeling, the researchers administered a scale to a pattern of 155 Taiwanese learners. The scale included 4 additives of information of problem remember, information of college students' TPACK. The findings indicated that students' perceptions of technological expertise and knowledge of college students' information directly encouraged TPACK. Information of difficulty depend and understanding of students' understanding are circuitously correlated with

TPACK with enormous mediation of technological information. Likewise, Chang, Jang, and Chen (2015) traced the trade in college students' perceptions of their teachers' TPACK over a length one semester in two contexts of Taiwan and China. To gather the data, TPACK scale, teacher interviews, and observations were used. The findings showed that the perceptions of students on instruction performance of their teachers helped teachers to have greater mirrored image on their instruction and progressed a number of their teaching strategies and behaviors.

Cardoso Valle and Junior (2021) investigated the professional knowledge of mathematics teachers about digital technological resources and their possible incorporation in pedagogical practices. A qualitative research was carried out on teachers working in high school, technical and higher education who participated in a short-term educational system proposal. The research was based on meetings with mathematics teachers, in which the use of resources was discussed and lesson plans were elaborated; they were, then, followed up in a real scenario. Specific instruments, lesson plans, audiovisual records, and interviews were analyzed by Textual Discursive Analysis (TDA), provided evidence about teachers' use of resources. Different professional knowledge linked to TPACK were recognized at different levels and some factors such as professional experience and technological appropriation proved to be influential.

Alhadiah, (2020) investigated the perspectives of learners regarding the use of one of the programs that can be used for vocabulary learning. The main findings of the study show that the students demonstrated positive attitudes towards the use of Quizlet in English vocabulary learning. They perceived it as a useful program that was easy to use, and they reported the intention to use it in the future. The present study highly recommends the use of MALL-based tools for vocabulary learning for their usefulness inside and outside the classroom.

Makalesi (2018) aimed to define students' views on the effects of a mobile assisted vocabulary learning (MAVL) application (VocaStyle), which was developed by the researcher, on their learning process and their learning styles' impact on their views. The data was analyzed with thematic content analysis. The findings revealed that students found the MAVL application effective, motivating and useful. The findings also indicated that participants found video and graphic annotations more useful and their views changed depending on their learning styles.

Hashemifardnia, Namaziandost and Rahimi Esfahani (2018) investigated the effects of using WhatsApp on Iranian EFL learners' vocabulary learning. The results of paired and an independent samples t-tests indicate that there was a significant difference between the post-tests of the experimental and the control groups. The findings reveal that the experimental group significantly outperformed the control group on the post-test. Khansarian-Dehkordian and Ameri-Golestan (2017) scrutinized social networking effects on Iranian EFL learners' vocabulary acquisition. Results of the independent-samples t-test in the posttest indicated that participants of the experimental group outperformed those of the control group. Results have important implications for both pedagogy and theory, especially socio-cultural theories of second language development.

Khubyari and Haddad Narafshan (2016) explore the impact of mobile assisted language learning (MALL) on EFL learners' reading comprehension. To see the impact of MALL on EFL learners' reading comprehension, reading comprehension test in form of multiple choice and some open ended questions was used as a pretest and posttest to assess the participants' reading comprehension in both control and experimental group. The result revealed that EFL learners favor reading comprehension via mobile phones due to the convenience facilitated by the portability and accessibility of the mobile phones. Khadem Estarki and Bazayar (2016) explored the effect of using mobile-assisted language learning (MALL) on pre-intermediate learners' writing performance. The results of statistical analysis of post-test writing scores revealed that MALL had a significant impact on the writing skill of the experimental group.

Najmi (2015) studied the effect of MALL on writing of Iranian upper-intermediate EFL learners. The experimental participants had to send their sentences to their teachers and their classmates via text message in order to get feedback if necessary. They were also given android grammar software so that they could get help when they needed. The method in the control group was pencil-and-paper. The results showed that there was a difference in performance of the experimental and the control groups which mean the experimental group did better in posttest. Rezaei Mai and Pesaranghader (2014) investigate the use and effectiveness of mobile applications in English vocabulary learning. The quantitative data revealed positive change in learners' performance and the questionnaire analysis indicated that using the applications helped enhance learning of vocabulary, confidence, class participation and that, students had a positive tendency toward the use of multimedia in education.

SorayyaeiAzar and Nasiri (2014) aimed to investigate Iranian EFL learner's attitudes toward the effectiveness of mobile assisted language learning on their Listening comprehension. The results of this study indicated that the experimental group receiving instruction through cell-phone based audiobooks outperformed the control group on their listening comprehension. Fageeh (2013) explored the benefits of mobile phone

applications with regard to their potential for improving vocabulary learning and motivation. The results indicated that experimental participants had enhanced motivation perceptions compared to the control participants. While further research is needed, the analysis of data indicates that the use of mobile phones is a viable vocabulary instructional/learning method at the college level.

Method

Participants

The whole population of the present study was 114 Iranian EFL students studying English as foreign language at Payame Noor University in Garmsar, Iran. The students varied in age from 20 to 23 years old. Most of the students studied English for an average period of 1 to 1.5 years, mainly through several private language institutes in different cities in Semnan province. They took Oxford placement test and 48 intermediate students who got the band score of the placement test (i.e., from 30 to 45) were considered as the intermediate learners and participated in this study. The participants were non-randomly selected from all Payame Noor university students of the higher education institute. Later, these participants were divided into one experimental and one control groups (n=24).

Instrumentations

Two instruments were utilized in order to investigate the possible effects of teaching reading skill based on TPACK principles on the university students' reading comprehension performance. They are as follows:

OPT

The OPT was given to participants to find out their homogeneity level. It is a placement test for homogenizing the whole population of the study as intermediate EFL learners. The test helped the researcher to make sure if all of the subjects were in intermediate level of proficiency. After consultation with many teachers to assess the learners' knowledge of language as well as their receptive and productive skills, the placement test was administered. The OPT was used to measure the learners' general language ability so they could be placed into the appropriate level for the research. It is the test of language proficiency presented by *Oxford University Press, Local Examination Syndicate* which provides tutors with a reliable and time-saving technique for determining the proficiency level of a learner. This test consists of 60 items in two parts: Part one with the first 40 multiple-choice items and part two with 20 multiple-choice items. Regarding validity and reliability of the test, The OPT is regarded as the standard test (it is a reliable and valid test).

Reading Pretest and Posttest

In order to measure reading ability before and after the treatments, the two groups of this study were given pretest and posttest. In other words, to evaluate the reading instruction for the EFL students and to measure the effectiveness of the treatments of the study, the pretest and posttest consisted of two reading parallel tests extracted from Nelson English language tests (intermediate level published by Cambridge university press) were administered. This test consists of 50 items and two parts: part one with the first 14 questions in part two which included the next 36 items. The participants had 40 minutes to answer the questions. Regarding validity and reliability of the reading tests, these tests are regarded as the standard tests. The tests were proved as reliable and valid instruments.

Teaching Material

In the present study, 10 reading passages from *American English File²* by Latham-Koenig and Oxenden in (2003) were selected to be taught to the EFL learners because the course book was taught in the Language Institutes as intermediate level. *American English File 3* gets students to talk thanks to its unique and proven formula combining confidence-building, opportunity, and motivation. High-interest contents are organized in lively, achievable lessons, using humor and imagination to encourage students to communicate and enjoy learning English. Solid grammar, vocabulary, and pronunciation foundation carefully supports the work with the four skills and gradually builds students' confidence and performance in English. Some of the main importance of the materials are:

- a) Great texts that motivate students to talk.
- b) Four-skill syllabus with a clear focus on pronunciation.
- c) Level-specific features to address learners' different needs.
- d) Online skills materials offer further practice in all four skills.
- e) Test Generator CD-ROMs.
- f) Online support, resources, and lesson ideas.

Procedure

This research was administrated in 2023-2024 academic year. The teacher spoke both English and Persian during the experiment. In order to conduct the research study and to test the research null hypotheses, the following steps were taken:

Administering the OPT

The OPT (2015, version 2) presented by Oxford University Press was used as a homogeneity test to select the homogenous language learners. It is a homogeneity test for homogenizing all the participants of the study as intermediate EFL learners. This homogeneity test reveals that language learners have mastered the basics of English and have practical language skills for everyday use. This test consists of 60 questions and two parts: part one with the first 40 questions in part two which included the next 20 items. The participants had 30 minutes to answer the questions. After administering the placement test, 48 EFL learners were selected to take part in the study as one experimental and one control groups (n=24).

Administering the Pretest

The participants of this study were given the reading pretest. This test consists of 50 items and two parts: part one with the first 14 questions in part two which included the next 36 items. The participants had 40 minutes to answer the questions.

The Treatment

The third step in this study was to administer the treatment. The whole instruction for both groups take place in 18 sessions (each group received 9 sessions) and each session lasted for 60 minutes. The experimental group was taught the reading passages through the use of TPACK principles. In order to do this, 9 reading passages extracted from American English Files³ were selected because the participants of the present study were taught the book at intermediate level. Each session, one reading passage was taught to the group. Mishra (2006) introduced the TPACK framework with seven components. Three areas of knowledge are found at intersection of this framework. Content (C) is the subject matter, technology (T) is the implementation of any technology used in to teaching and pedagogy (P) is the collected practices, procedures, methods and approaches used while teaching that content through technology. On the other hand, the control group was taught the reading passages without any TPACK principles.

Administering the Posttest

Having finished the instructional period, the two groups took part in the reading posttest. The Nelson test consists of 50 items and two parts: part one with the first 14 questions in part two which included the next 36 items. The participants had 40 minutes to answer the questions.

Data Analysis

The descriptive data consisting of the mean and the standard deviations were used to compare the EFL learners' achievement in reading ability before the instruction to that of after the instruction. Moreover, test normality of data using both graphical and numerical methods was run. At last, a series of independent samples t-tests were used for inferential statistics.

Results

Descriptive Statistics

Table 1: Descriptive Statistics for the Pretest and Posttest Scores

Groups	Test	N	M	SD	Max	Min
Experimental	Pretest	24	20.55	2.35	40	15
Experimental	Posttest	24	37.43	4.00	47	19
Control	Pretest	24	21.91	2.62	38	16
Control	Posttest	24	25.11	3.98	42	17
Valid N						

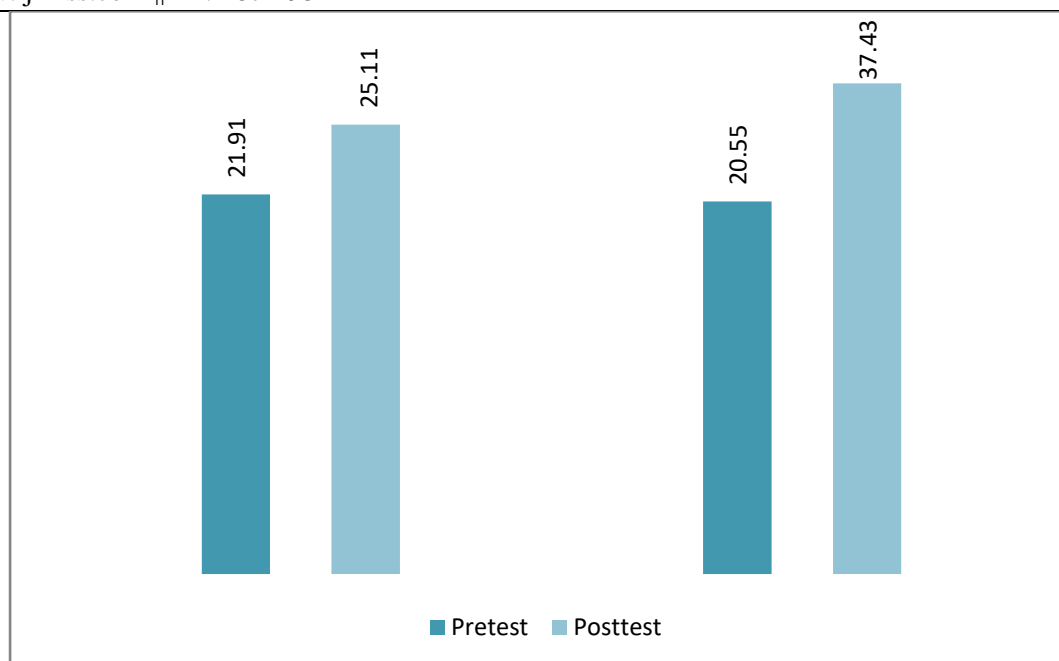


Figure 1: Descriptive Data for the Pretest and Posttest Scores

Based on the results, the mean score of the experimental group did have substantial increase in the posttest in comparison with the pretest stage. Moreover, the mean score of the control group had an increase in the posttest in comparison with the pretest stage. Although the mean score of the control group was greater than the mean scores of experimental group in the pretest stage, the mean score of the experimental group was greater than the mean score of the control group in the posttest stage.

Normality

Table 2: Checking the Normality

Groups	Tests	Kolmogorov- Smirnov ^a			Shapiro- Wilk		
		Statistic	df	P	Statistic	df	P
Control	Pretest	0.50	24	0.92	0.20*	24	0.10
	Posttest	0.19	24	0.93	0.19	24	0.15
Experimental	Pretest	0.57	24	0.90	0.20*	24	0.13
	Posttest	0.43	24	0.96	0.20*	24	0.18

Based on obtained results, the observed p-value for the pretest and posttest of the control and experimental groups were presented respectively. Based on the results from Kolmogorov-Smirnova and Shapiro- Wilk tests, the p-value for each test was greater than the error value 0.05 ($p > 0.05$). Therefore, the scores had a normal distribution.

Inferential Statistics

In order to answer the research question, the scores obtained from the pretest and posttest were examined by two independent samples t-tests.

Table 3: Independent Samples t-test for the Reading Pretest

Levene's Test for Equality of Variances		t-test for Equality of Means							
F	P	t	df	P. (2-tailed)	MD	SED	95% Confidence Interval of the Difference		
							Lower	Upper	
Equal variances assumed	2.79	0.086	-0.53	46	0.55	-0.33	0.54	-1.49	0.77

Equal variances not assumed	-0.53	40.03	0.55	-0.33	0.54	-1.49	0.77
-----------------------------	-------	-------	------	-------	------	-------	------

Based on the results, there was no significant difference between the experimental and control groups in terms of reading comprehension performance ($t(46) = -0.53, P > 0.05$).

Table 4: Independent Samples t-test for the Reading Posttest

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	P.	t	df	P. (2-tailed)	MD	SED	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	3.06	0.081	2.16	46	0.8	1.82	0.99	0.06	3.59
Equal variances not assumed			2.16	39.89	0.08	1.82	0.99	0.06	3.59

Based on the results, there was significant difference between the experimental and control groups in terms of reading comprehension ($t(46) = 2.16, 0.07 < 0.05$). In other words, teaching reading skill based on TPACK principles did have any statistically significant effects on Iranian the students' reading comprehension performance.

Conclusions

Based on the data analysis procedure, reading comprehension ability of experimental and control groups improved. However, the learners in experimental group outperformed the learners in control group at the significant level. Based on the findings, teaching reading skill based on TPACK principles did have statistically significant effects on the students' reading comprehension performance. It can be concluded that when students are exposed to TPACK principles during reading instruction, they become aware of the processes that can be applied in better understanding the reading passages. In other words, applying the TPACK principles could be useful in developing second/foreign language learning in general and reading comprehension in particular.

Discussion

The proposed research question concerned whether teaching reading skill based on TPACK principles improved the university students' reading comprehension performance. The obtained results proved teaching reading skill based on TPACK principles did have significant effects on the students' reading comprehension. The study's findings are in line with the following research studies:

- Tseng (2014) investigated the EFL students' perceptions of the TPACK of their instructors with the aid of administering a legitimate learner-primarily based scale. The findings of the look at discovered that the scholars considered their teachers to be greater capable in 3 areas of middle information than in the interfaces among them. More particularly, it became located that scholars' perceptions have been that their teachers' content information became better than their integrated TPACK.
- Alijani, et al., (2014) tested the cognitive approaches, applicable factors, and advantages of using mixed-learning to know models inside KIPP in New Orleans, Louisiana. The results revealed that ninety four% of the respondents believed that mixed studying will increase a faculty's educational fulfillment. The effects of this have study additionally indicated that the transition to a mixed-learning model benefitted college students with the aid of permitting them to study at their personal individual paces, and instructors by using permitting them to offer extended person interest while needed.
- Camahalan and Ruley (2014) carried out studies focusing on the usage of blended learning of for middle college writing preparation. The researchers discovered student mastering confirmed higher increase with the use of a combined-learning to know surroundings.
- Chuang, et, al. (2018) examined students' perceptions of English instructors' knowledge in managing technology-supported instructions. The findings indicated that students' perceptions of technological expertise and knowledge of college students' information directly encouraged TPACK.
- Chang, Jang, and Chen (2015) traced the trade in college students' perceptions of their teachers' TPACK over a length one semester in two contexts of Taiwan and China. The findings showed that the

- perceptions of students on instruction performance of their teachers helped teachers to have greater mirrored image on their instruction and progressed a number of their teaching strategies and behaviors.
- f) Cardoso Valle and Junior (2021) investigated the professional knowledge of mathematics teachers about digital technological resources and their possible incorporation in pedagogical practices. Different professional knowledge linked to TPACK were recognized at different levels and some factors such as professional experience and technological appropriation proved to be influential.
 - g) Alhadiah, (2020) investigated the perspectives of learners regarding the use of one of the programs that can be used for vocabulary learning. The main findings of the study show that the students demonstrated positive attitudes towards the use of Quizlet in English vocabulary learning. They perceived it as a useful program that was easy to use, and they reported the intention to use it in the future.
 - h) Makalesi (2018) aimed to define students' views on the effects of a mobile assisted vocabulary learning application, which was developed by the researcher, on their learning process and their learning styles' impact on their views. The findings also indicated that participants found video and graphic annotations more useful and their views changed depending on their learning styles.
 - i) Hashemifardnia, Namaziandost and Rahimi Esfahani (2018) investigated the effects of using WhatsApp on Iranian EFL learners' vocabulary learning. The results of paired and an independent samples t-tests indicate that there was a significant difference between the post-tests of the experimental and the control groups.
 - j) Khansarian-Dehkordi and Ameri-Golestan (2017) scrutinized social networking effects on Iranian EFL learners' vocabulary acquisition. Results indicated that participants of the experimental group outperformed those of the control group.
 - k) Khubyari and Haddad Narafshan (2016) explore the impact of mobile assisted language learning on EFL learners' reading comprehension. The result revealed that EFL learners favor reading comprehension via mobile phones due to the convenience facilitated by the portability and accessibility of the mobile phones.
 - l) SorayyaeiAzar and Nasiri (2014) aimed to investigate Iranian EFL learner's attitudes toward the effectiveness of mobile assisted language learning on their Listening comprehension. The results of this study indicated that the experimental group receiving instruction through cell-phone based audiobooks outperformed the control group on their listening comprehension.
 - m) Fageeh (2013) explored the benefits of mobile phone applications with regard to their potential for improving vocabulary learning and motivation. The results indicated that experimental participants had enhanced motivation perceptions compared to the control participants.

Limitations

There is no study which can be conducted under real circumstances. Every research has its own problems and the following limitations may have affected the present study and generalizability of its findings. In the present study, some limitations might affect the outcome of the research. First of all, the selection of the participants of this study was limited to the availability sampling of 46 Iranian intermediate students in Payame Noor University. Thus, the findings of this investigation may lack generalizability to other age groups of L2 learners with different English proficiency levels.

Implications

The research findings present some implications. Language studies in the domain of teaching reading are well advised to take implications presented in this study into thoughtful account. Based on the findings, it is suggested that EFL learners may use TPACK principles to improve reading comprehension and rely less on face to face teaching methods. One of the main goals of language teaching and learning is to develop language learners' abilities in communicative skills. Thus, using TPACK principles as a novel procedure may help learners to achieve the purpose. The area of teaching reading is very important particularly in the present condition of requirement of English in Iran where English is taught as a foreign language, so change from teaching traditional methods to novel ones is required to make sure learners' engagement in teaching reading process.

References

- [1]. Alhadiah, A. (2020). EFL learners' experience of a MALL-based vocabulary learning tool. *Indonesian Journal of Applied Linguistics*, 10(2), 283-291.
- [2]. Cavus, N., & Ibrahim, D. (2009). M-Learning: An experiment in using SMS to support learning new English language words. *British Journal of Educational Technology* 40 (1), 78-91.

- [3]. Chwo, G. S. M., Marek, M. W., & Wu, W. C. V. (2018). Meta-analysis of MALL research and design. *System, 74*, 62-72.
- [4]. Fageeh, A. (2013). Effects of MALL applications on vocabulary acquisition. *AWEJ, 4*(4), 420-447.
- [5]. Gilakjani, A. P., Leong, L. M., & Ismail, H. N. (2013). Teachers' use of technology and constructivism. *International Journal of Modern Education and Computer Science (IJMECS), 5*(4), 49-68.
- [6]. Hashemifardnia, A., Namaziandost, E., & Rahimi Esfahani, F. (2018). The effect of using WhatsApp on Iranian EFL learners' vocabulary learning. *Journal of Applied Linguistics and Language Research, 5*(3), 256-267.
- [7]. Hosseini, F., Bakhshipour Khodaei, F., Sarfallah, SH., & Dolatabadi, H. R. (2012). Exploring the relationship between critical thinking, reading comprehension and reading strategies of English university students. *World Applied Sciences Journal, 17* (10), 1356-1364.
- [8]. Jitpaisarnwattana, N., & Reinders, H. (2021). Language MOOCs. In L. Lontas (Ed.), *The TESOL encyclopaedia of English language teaching* (pp. 1-6). Wiley.
- [9]. Khubyari, L., & Haddad Narafshan, M. (2016). A study on the impact of mall (mobile assisted language learning) on EFL learners' reading comprehension. *International Journal of English Language Teaching, 4*(2), 58-69.
- [10]. Mahfoodh, O. H. A. (2007). *Reading for EFL college students*. Retrieved from: <http://www.yementimes.com/article.sthtml>.
- [11]. Makalesi, A. (2018). The effects of a mobile assisted vocabulary learning application on vocabulary learning. *Turkish Online Journal of Qualitative Inquiry (TOJQI), 9*(3), 288-311.
- [12]. Najmi, K. (2015). The effect of mobile-assisted language learning (MALL) on guided writing skill of Iranian upper-intermediate EFL learners. *Journal of Applied Linguistics and Language Research, 2*(4), 42-52.
- [13]. Norazah, M. N., Hamzah, M. I., Melor, M. Y., & Embi, M. A. (2010). The mobile learning environment for the in-service school administrators. *Procedia-Social and Behavioral Sciences, 7*, 671-679.
- [14]. Read, T., & Bárcena, E. (2013). MOOCs and open higher education: the case of UNED. In G. Palazzo (Ed.), *Proceedings of Ikasnabar 2013 – 6th International Conference on Open Education and Technology*. Publishing Services of the University of the Basque Country.
- [15]. Rezaei, A., Mai, N., & Pesaranhader, A. (2014). The effect of mobile applications on English vocabulary acquisition. *Jurnal Teknologi (Sciences & Engineering) 68* (2), 73-83.
- [16]. Richards, J. C., & Schmidt, R. (2010). *Longman dictionary of language teaching and applied linguistics* (4th Ed.). London: Longman.
- [17]. Samsiah, B., & Azidah, A. Z. (2013). Adoption and application of mobile learning in the education industry. *Procedia-Social and Behavioral Sciences, 90*, 720-729.
- [18]. Sorayyaei Azar, A., & Nasiri, H. (2014). Learners' attitudes toward the effectiveness of mobile assisted language learning (MALL) in L2 listening comprehension. *Procedia-Social and Behavioral Sciences, 98*, 1836-1843.
- [19]. Stockwell, G. (2008). Vocabulary on the move: Investigating an intelligent mobile phone-based vocabulary tutor. *Computer Assisted Language Learning, 20* (4), 365-83.