

# The Effect of Adobe Connect Virtual Classrooms on Medical Students' Technical Vocabulary Learning: Achievements and Challenges

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## Abstract

**Aims:** With advances in computer technology, the recent decade has witnessed a growth in resources and an increase in the availability of devices for language learning and teaching. This study aimed at investigating the effect of Adobe Connect virtual classrooms on technical vocabulary learning of students of medicine as well as to explore their attitudes toward Adobe Connect virtual classrooms. **Materials and Methods:** This quasi-experimental study was performed on 60 EFL students of medicine studying at Kashan University of Medical Sciences, Kashan, Iran. To ensure the participants' homogeneity in terms of language proficiency, the Oxford Quick Placement Test was used. The participants were randomly divided into two groups ( $n = 30$ ): conventional teacher-centered and Adobe Connect virtual groups. Data were collected using pre- and post-tests of technical medical vocabularies to evaluate vocabulary knowledge and a five-point Likert scale to evaluate the students' attitudes toward Adobe Connect virtual classrooms. Data were analyzed using an independent *t*-test and a paired *t*-test by SPSS version 22. **Results:** The results revealed no significant difference in the mean scores of the vocabulary test between the conventional teacher-centered and Adobe Connect virtual groups before training ( $P = 0.757$ ); however, the mean vocabulary scores after training in the Adobe Connect virtual group was significantly higher than the conventional group ( $P < 0.001$ ). **Conclusion:** The findings of the present study show the effectiveness of the Adobe Connect virtual classrooms and students' satisfaction with such a virtual environment in terms of technical medical vocabulary learning.

**Keywords:** Adobe Connect, medical students, attitudes, technical vocabulary learning, virtual classrooms

## INTRODUCTION

Since the beginning of the 21<sup>st</sup> century, digital multimodal instruction has gained ground and its potential for second language teaching skills and sub-skills has been identified by different researchers.<sup>[1-3]</sup> Technology has become a staple in many homes across the globe over the past few decades. Its effect has penetrated into all realms of society including L2 teaching. Nowadays, it is a common ground that teachers use various technology-based tools for teaching such as Twitter, Facebook, What's App to inform students through blogs and other platforms.<sup>[4-6]</sup> This has also become apparent in the

academic system ever more, so that educational centers like schools and universities are using technical instruments for students to work on various topics.<sup>[7]</sup> Digital learning has created a huge transformation in the lives of both teachers and learners. Online instruction is "anywhere-anytime" and the concept is encompassing and serving employees as well as learners, hence the knowledge can be delivered when and where individuals need it.<sup>[8]</sup> Several studies have shown that

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the integration of science and technology learning can boost the innovation, problem-solving abilities, and interest of students in scientific fields.<sup>[1,9,10]</sup> Owing to the widespread access to high Internet connectivity and support for video and audio interactivity, the elements that make up virtual classrooms have dramatically improved during the past years.<sup>[11,12]</sup> Virtual classrooms as one of the new technologies have gained importance. Digital classrooms are conventionally known as “spaces” wherein users can learn simultaneously through using certain software that enables them to communicate like they do in a brick-built school, and sequentially universities and other organizations have spread virtual classrooms worldwide, offering education to those who are unable to attend traditional universities due to the distance, time or other reasons.<sup>[13]</sup> One of the educational digital platforms, which have been recently used for teaching English in Iranian universities is the Adobe Connect virtual environment. Adobe Connect has been used in universities and some language institutes for the aim of teaching due to the change of world’s condition where the coronavirus has affected most areas, especially education.

Furthermore, successful learning of new words or vocabularies in every language is among the key objectives to be accomplished by language students. If the mastery of vocabulary is not rich enough, it may be difficult to carry out a message or communicate in a language, even if the knowledge in grammar is high enough. Many ESL/EFL learners must have learned to practice and recall words for the bulk of their time spent on the foreign language. In second language programs, vocabulary teaching and learning were often given little priority, but there has recently been a growing trend in the essence of vocabulary and its significance in education.<sup>[14]</sup> Therefore, the present study used the Adobe Connect virtual classroom to explore its effectiveness on promoting Iranian medical students’ vocabulary performance. Another issue investigated in this study was to consider the perceptions and attitudes of the students who took part in Adobe Connect virtual classrooms regarding their satisfaction with the new instructional environment.

## MATERIALS AND METHODS

In this quasi-experimental study, the population included students of medicine studying at Kashan University of Medical Sciences, Kashan, Iran. They were 75 medicine students who had enrolled in an Advanced English course as a required part of the university curriculum. Of 75 students, only 60 students were included in the study and 15 subjects did not meet the established criteria of the study. The inclusion criteria for this study included filling out the consent form for participating in the study, having taken the General English language course in prior semesters, the participants’ attendance in all sessions, as well as the willingness to participate in the study. The Oxford Quick Placement Test (OQPT) was used to evaluate the participants’ level of English language proficiency. This test included 60 questions on different skills and sub-skills and the time allocated to the administration of the test was 45 min. Participants were randomly divided into two groups ( $n = 30$ ):

the conventional/traditional teacher-centered and Adobe Connect virtual groups. To determine the sample size according to the standard deviation and using Equation (1), with a 99% confidence interval, the number of samples in each group was 27 people. Taking into account the loss of 10% of the samples, 30 people were determined for each group (60 people in total).

Equation (1):

$$n = \frac{(Z_{(1-\alpha/2)} + Z_{(1-\beta)})^2 (sd_1^2 + sd_2^2)}{d^2}$$

Data were collected using a researcher-made test of medical technical vocabulary (40 multiple-choice items) from a book entitled “Advanced English in Medicine” to evaluate the vocabulary knowledge of the students before and after the treatment. Finally, a five-point Likert scale consisting of 10 expressions with five alternative responses, including (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, and (5) strongly agree was presented to the students in the Adobe Connect virtual classroom to investigate their attitudes toward learning through virtual classrooms. Taking account of the essential function of validity, the test and questionnaire were expert-validated by three instructors who had experience in teaching specialized English courses at Kashan University of Medical Sciences and Kashan University and some revisions were made. Also, the vocabulary test was piloted with 15 students before the treatment to estimate the reliability of the test ( $r = 0.67$ ). An acceptable level of Cronbach’s alpha was reported for the vocabulary test ( $\alpha = 0.81$ ). It is worth mentioning that these 15 students were considered as outliers and they did not enter into the process of treatment.

The participants in the experimental group were taught by Adobe Connect virtual method of instruction during eight sessions of 90 min. For the virtual class group, before the experiment began, the teacher explained to the students the challenges of Adobe Connect virtual classrooms. The medical students in both groups knew that they were under intervention as they had already signed the consent form. Before the treatment, the instructor explained how to use the Adobe Connect virtual classroom, how to take the materials electronically, and how to reach the instructor online for particular training sessions. This aimed to guarantee that the participants in the treatment group had no trouble using the Adobe Connect instructional format in the experiment so that they could fulfill the general English duties and online tasks for the remainder of the educational plan. At the virtual classroom, the researcher as the instructor of the course was enabled to utilize the online classroom for various learning tasks, such as providing materials, conducting lectures orally, reviewing presentations from learners, recording the sessions, and sharing multiple documents on the screen. During each session, a text containing 15 unfamiliar words was bold-faced. They were selected from the coursebook understudy and were given to the participants through slides. The main responsibility of the teacher during the treatment phase was to encourage the students to suggest any cross-links between the new words with

the previously learned ones and add the other words on the whiteboard. Then the students were required to make sentences using the vocabularies they learned and resent them to the teacher to get feedback orally or in written form. This activity could help students to work with peers to grasp the meanings. The teacher’s main duty in the treatment phase was to direct the class and help the students learn new vocabularies. Throughout the treatment, the teacher also served as a facilitator by providing technical support on using the different components of the online course, and responded to individual students’ needs, comments, and questions for both the technical problems that occurred within the online classrooms and for the possible difficulties in learning and practicing new words. The teacher sent messages to encourage the students to interact and communicate. She did not correct spelling and grammatical mistakes, but the errors in the new words taught were corrected by pointing out the type of errors they made especially in the technical vocabularies and asking the students to double-check their posts and spoken sentences or correcting each other’s mistakes. In terms of formative assessment, the students’ classroom participation and their discipline in doing homework regarding the technical words were given the positive score or mark; however, for the summative assessment, the scores of the tests, especially the posttest of vocabulary were of prime importance. Furthermore, the students had the time to have presentations orally and discussion sessions for extra practice of the learned words with the peers and the instructor.

In terms of traditional vocabulary instruction in the form of a face-to-face classroom, the students were taught the same new words embedded in the contextualized reading passages and

via definition, translation, antonyms, and synonyms, which are more common in Grammar Translation Method. The explicit explanation of the vocabularies was presented by the teacher in the beginning of the class before the students started reading the texts. The main responsibility of the learners in the control group was to memorize the list of new vocabularies in each session, translate them, and make sentences, while the main duty of the instructor was to instruct the new words explicitly. Like the treatment group, the students of the traditional group were aware of the research as well as their role in it. It should be mentioned that the students were not allowed to change their group. It seemed that all of the students were satisfied with the type of instruction and nobody wanted to be taught in the other type of teaching method. The only difference between the two groups was the environment (virtual vs. conventional face-to-face classroom). The treatment lasted for eight sessions. Two weeks after the treatment, the same test was used as a posttest of vocabulary in both groups. The scores from the tests were used by the researcher to report the result of treatment on vocabulary learning of the students before and after the treatment using SPSS version 22 (SPSS, Inc., Chicago, IL, USA) and the quantitative data were reported as the mean and standard deviation, and the qualitative ones were reported as frequency and percentage. The significance level was set at  $P > 0.05$ .

## RESULTS

The mean age of the participants was  $21 \pm 5.3$  years (range, 19–30 years). From a total of cases, 36 students (60%) were female and the rest were male. The results of an

**Table 1: The mean scores of vocabulary knowledge before and after the treatment in the conventional and Adobe Connect groups**

Independent sample <i>t</i> -test	Mean $\pm$ SD		<i>P</i> *
	Adobe Connect Virtual	Conventional teacher-centered	
Pretest	6.96 $\pm$ 1.56	6.96 $\pm$ 1.49	0.757
Posttest	15.74 $\pm$ 1.62	10.07 $\pm$ 1.65	<0.001
<i>P</i> **	<0.001	<0.001	-

\*Independent *t*-test, \*\*Paired *t*-test. SD: Standard deviation

**Table 2: The frequency and percentage of students’ attitudes toward Adobe Connect virtual classrooms**

Statements	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Presenting the content in the form of slides along with the sound and quality of the slides from an audio-visual point of view	1 (3.3)	4 (13.3)	0	3 (10)	22 (73.4)
View the instructor and slides simultaneously	2 (6.7)	0	2 (6.7)	8 (26.6)	18 (60)
Number of exercises and presenting exercises regularly	0	1 (3.3)	0	4 (13.3)	25 (83.4)
Immediately correcting the exercises along with providing feedback	2 (6.7)	8 (26.6)	3 (10)	12 (40)	5 (16.7)
Ease of working with adobe connect software environment	5 (16.7)	6 (20)	3 (10)	13 (43.3)	3 (10)
Ease of students’ access to the professor through adobe connect software	2 (6.7)	2 (6.7)	5 (16.7)	17 (56.6)	4 (13.3)
Students interact and talk with each other and the teacher through adobe connect software	4 (13.3)	6 (20)	1 (3.3)	10 (33.3)	9 (30)
Previous acquaintance of students with Adobe Connect virtual environment	6 (20)	9 (30)	8 (26.6)	2 (6.7)	5 (16.7)
Save and archive course materials and access them at any time and place	1 (3.3)	12 (40)	2 (6.7)	8 (26.6)	7 (23.4)
Access to useful reference resources and provide educational packages in the form of videos and attractive educational programs by the teacher	2 (6.7)	3 (10)	2 (6.7)	13 (43.3)	10 (33.3)

independent samples *t*-test showed no significant difference in the mean scores of the vocabulary test between the conventional teacher-centered and Adobe Connect virtual groups before the training ( $P = 0.757$ ); however, the mean vocabulary scores after the training were different in the two groups in such a way that in the Adobe Connect virtual group, it was significantly higher than the control group ( $P < 0.001$ ) [Table 1]. Moreover, according to the results of the paired *t*-test, comparison of the mean scores of vocabulary learning before and after the intervention showed a significant difference in students' knowledge in both groups; so that the mean scores of technical vocabulary knowledge in the Adobe Connect group before and after the training were  $6.96 \pm 1.56$  and  $15.74 \pm 1.62$ , respectively ( $P < 0.001$ ). In the conventional group, the mean vocabulary scores before and after the training were  $6.96 \pm 1.49$  and  $10.07 \pm 1.65$ , respectively ( $P < 0.001$ ).

Furthermore, regarding the attitudes of the students toward teaching through Adobe Connect virtual environment, the results of Table 2 showed that in all the statements (except statement number 8), at least 50% of all the participants' attitudes were in the range of agree or strongly agree.

## DISCUSSION

The findings revealed that the the mean score of learners in the Adobe Connect virtual classroom was higher than that of the control group in terms of vocabulary performance. This suggests that the web-integrated/blended-learning instruction could positively affect the new word learning of the students. A justification for such significant results may be the students' familiarity with the computer, information technology, and the Internet in the Iranian context, and as a result, the over-reliance of students on self-study at home. This is in line with the results of some studies, which indicated that technology-enhanced learning environments are superior to environments without such conditions.<sup>[15-17]</sup> the Web-integrated/blended learning instruction can be advantageous over traditional environments due to its potential to allow students to study the program at their own rates.<sup>[18]</sup> Also, some studies have revealed the positive impacts of virtual environments on learners' oral language proficiency. Canto, *et al.* found that collaboration in the virtual space and virtual classrooms boosted Japanese college learners' performance in oral tests.<sup>[19]</sup> More recently, some studies examined the effects of 3D virtual worlds (3DVWs) on language learning via a meta-analysis and evinced that the 3DVW applications could improve L2 learners' vocabulary learning and promote their autonomy.<sup>[20,21]</sup> In addition, several empirical studies examined the positive effects of virtual classrooms and online education on vocabulary learning.<sup>[22,23]</sup> However, more empirical evidence needs to be accumulated to substantiate such effects, especially using Adobe Connect virtual classrooms for teaching technical vocabularies of medical students. Furthermore, the results of the questionnaire evinced that although the Adobe Connect virtual classrooms had some demerits, in fact, its benefits were more than those of negative points. Although

teachers and students in the implementation of virtual tools and classrooms, in many ways, may face several difficulties, such as the challenge with mass media, the choice of suitable materials to be used in the online world, and low speed of internet (especially in Iran), it can be a new experience for both teachers and students. Moreover, the reshaping of certain conventional and popular assumptions regarding the usefulness of using virtual classrooms could be a huge challenge. However, as it was evident from both quantitative and qualitative results, Adobe Connect improved the technical vocabulary performance of the medical students at the university level. The reason for the effectiveness of web context in vocabulary learning of Iranian medicine students could be attributed to the role of the Adobe Connect new environment that created attraction and novelty possibly leading to an increased level of students' autonomy and self-dependence. Previous research has shown the effectiveness of online courses.<sup>[24,25]</sup> The autonomy or independent learning component is mentioned to be an important element for web-based learners since students learning in a web-based environment with positive attitudes toward independent learning could become more accountable, more inherently focused, and more demanding. Moreover, they can actively regulate their cognition, motivation, or behavior, and thus achieve their goals and perform better.<sup>[26]</sup> Therefore, a web-integrated/blended-learning environment, which is characterized by the autonomy of the learner, increases students' achievements in learning a second language like English. There were various elements that made the generalizability of this piece of study open to question. One such limitation was the learners' level of proficiency. Findings limited to only one level of proficiency cannot be generalized to the other levels of general English knowledge. Another limitation is the learners who deliberately were selected from medical students of Kashan University of Medical Sciences.

## CONCLUSION

The findings of the present study show the effectiveness of teaching via Adobe Connect and students' satisfaction with such virtual classroom, especially in presenting the content, the quality of the sound and slides, quality of interactions, and ease of access to the course materials at any time. The results of this study may have some implications for learning as well as teaching English. Teachers can use the Adobe Connect virtual platform in their classes as a supplement to their courses. The present research can also offer implications for EFL students in that, instead of the traditional methods of instruction, they can try a mixture of different strategies such as computer-based scaffolding in their own learning experiences. Because there is no "one-size-fits-all" method of instruction, then, computer-based scaffolding allows the teacher and learner to provide a safe way to identify deeper root causes for problematic issues like vocabulary learning. Researchers are advised to try to investigate the consistency of results throughout a longer period (e.g., several years of education productivity) and in different topics in ESP courses in the future. No doubt knowing about the potential of

different learning environments and the way to implement new technology in a technology-enhanced environment to foster students' independent learning is of great value.

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### Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Huang SY, Kuo YH, Chen HC. Applying digital escape rooms infused with science teaching in elementary school: Learning performance, learning motivation, and problem-solving ability. *Think Skills Creat* 2020;37:100681.
- Sousa MJ, Rocha Á. Strategic Knowledge Management in the Digital Age: JBR Special Issue Editorial. *Journal of Business Research*. 2019;94:223-26.
- Warschauer M. Learning to write in the laptop classroom. *Writ Pedagogy* 2009;1:101-12.
- Beach P. Self-directed online learning: A theoretical model for understanding elementary teachers' online learning experiences. *Teach Teach Educ* 2017;61:60-72.
- Cansoy R. Teachers' professional development: The case of WhatsApp. *J Educ Learn* 2017;6:285-93.
- Kelly N, Antonio A. Teacher peer support in social network sites. *Teach Teach Educ* 2016;56:138-49.
- Dudeney G, Hockly N. ICT in ELT: How did we get here and where are we going? *ELT J* 2012;66:533-42.
- Balaaco B, Truscillo D. TESOL technology: New opportunities for learning styles and strategies with computers. *TESOL J* 1996;1:1-25.
- Perignat E, Katz-Buonincontro J. STEAM in practice and research: An integrative literature review. *Think Skills Creat* 2019;31:31-43.
- Tseng WT, Liou HJ, Chu HC. Vocabulary learning in virtual environments: Learner autonomy and collaboration. *System* 2020;88:102190.
- Britain S, Liber O. A Framework for the Pedagogical Evaluation of Elearning Environments. *Educational Cybernetics: Reports*. 2004.
- Vai M, Sosulski K, Vai M, Sosulski K, Vai M, Sosulski K, *et al.* Assessing online discussion forum participation. *Essentials of online course design: A standards-based guide*. Vol 5. New York: Macmillan; 2016. p. xi-xiii.
- Hiltz SR. Teaching in a virtual classroom. *Int J Edu Telecommun* 1995;1:185-98.
- Richards JC, Renandya WA. *Methodology in Language Teaching: An Anthology of Current Practice*. Cambridge: Cambridge University Press; 2002.
- Sadeghi K, Khanahmadi F. Dynamic assessment of L2 grammar of Iranian EFL learners: The role of mediated learning experience. *Int J Acad Res* 2011;3:931-35.
- Şendurur E, Yildirim Z. Development of metacognitive skills inventory for internet search (MSIIS): Exploratory and confirmatory factor analyses. *Element Educ Online* 2018;17:1896-911.
- Wang Q. A generic model for guiding the integration of ICT into teaching and learning. *Innov Educ Teach Int* 2008;45:411-9.
- Hodges CB, Forrest Cowan S. Preservice teachers' views of instructor presence in online courses. *J Dig Learn Teach Educ* 2012;28:139-45.
- Canto S, Jauregi K, van den Bergh H. Integrating cross-cultural interaction through video-communication and virtual worlds in foreign language teaching programs: is there an added value? *ReCALL* 2013;25:105-21.
- Wang C-p, Lan Y-J, Tseng W-T, Lin Y-TR, Gupta KC-L. On the effects of 3D virtual worlds in language learning a meta-analysis. *Computer Assisted Language Learning* 2020;33:891-915.
- Yeh YL, Lan YJ, Lin YT. Gender-related differences in collaborative learning in a 3D virtual reality environment by elementary school students. *J Educ Technol Soci* 2018;21:204-16.
- Mohsen MA. The use of help options in multimedia listening environments to aid language learning: A review. *Br J Educ Technol* 2016;47:1232-42.
- Lan YJ, Hsiao IY, Shih MF. Effective learning design of game-based 3D virtual language learning environments for special education students. *J Educ Technol Soc* 2018;21:213-27.
- Coetzee D, Fox A, Hearst MA, Hartmann B, editors. *Should Your MOOC Forum Use a Reputation System?* Proceedings of the 17<sup>th</sup> ACM Conference on Computer Supported Cooperative Work & Social Computing; 2014.
- Yukselturk E. An investigation of factors affecting student participation level in an online discussion forum. *Turk Online J Educ Technol* 2010;9:24-32.
- Broadbent J. Comparing online and blended learner's self-regulated learning strategies and academic performance. *Internet Higher Educ* 2017;33:24-32.