Shahid Rajaee Teacher Training University

The First National Conference on Technology-Enhanced Language Learning and Teaching:

Accomplishments and Challenges amid COVID-19 Pandemic

01220-41756

RICeST

February 9, 2023

The Impact of Multimedia-supported STEAM Activities on Language Learners' Development of Speaking and Listening Skills: The Case of Emergency Remote Teaching during COVID-19 Pandemic

Zeinab Hatami*, Mehrak Rahimi

English Department, Shahid Rajaee Teacher Training University, Tehran, Iran

z.hatami1374@gmail.com

INTRODUCTION

During the past decade, STEAM (Science, Technology, Engineering, Art, and Mathematics) education has gained growing attention. As a result, many researchers' attention worldwide has been shifting towards examining ways to integrate STEAM education with various disciplines, including education policy, curriculum design, and teaching evaluation.

Besides, in today's modern world, characterized by rapid technological changes, Computer Assisted Language Learning (CALL) is a new area that deserves attention in the field of language learning studies. Also, technology can be used to create a more student-oriented and expletory situation. Therefore, it is crucial for teachers to apply technology in the classroom to engage EFL learners.

In recent years, the quick spread of the COVID-19 Virus had a devastating impact on education professionals and led to the closure of academic centers for more than two years. Many studies examined the impact of Emergency Remote Teaching (ERT) on students' learning gains. Yet, there is a dearth of research on students' achievement in higher education in general and language learners in particular when innovative pedagogical approaches were integrated into the ERT.

EFL students struggling with learning listening and speaking and their reluctancy to talk in virtual classes on the one hand, and teachers dealing with how to teach and encourage students to master speaking and listening skills for students' real and future purposes in online courses, on the other hand, have made the situation more complex. Accordingly, to create engaging and practical learning conditions, integrating STEAM subjects into English classes to increase EFL students' knowledge in different disciplines and applying multimedia-supported learning environments to provide this comprehensible input would seem to be a suitable solution.

This study thus examined the impact of multimedia-enhanced STEAM activities on English as a foreign language (EFL) learners' development of listening and speaking skills in a university course that was delivered online during the COVID-19 pandemic.

METHOD

A total number of 42 advanced EFL students, aged between 20 to 22 years old, who were at an advanced level of proficiency were recruited for this research and were assigned to the experimental (n=21) and control (n=21) groups.

Prior to the study, both groups' listening and speaking proficiency was assessed by the listening and speaking sections of the IELTS.

Twenty-four multimedia clips were adapted from the YouTube for teaching topics related to STEAM based on the themes of the View Point 2 In each lesson, two multimedia were used to present the STEAM related domain.

To create a STEAM-centered classroom, the researcher followed the six steps, including focus, detail, discovery, application, presentation, and link.

The experimental group received multimedia-enhanced instruction where the concepts of each domain of STEAM were presented by multimedia presentations along the course. Meanwhile, the content was taught to the control group by conventional teaching.

The instruction was online and lasted for five months. The listening and speaking proficiency of both groups was assessed again after the study and the collected data were analyzed using a one-way Multivariate Analysis of Variance (MANOVA).

RESULTS

This study aimed to investigate the impact of multimedia-supported STEAM activities on the development of EFL learners' speaking and listening skills.

The collected data were analyzed using a one-way Multivariate Analysis of Variance (MANOVA). The outcomes revealed a significant difference between the two groups' speaking and listening skills as a combined variable [Wilks' Lambda = .855; F (39) = 3.295; p = .048; partial eta squared=.145]. Also, when the dependent variables were considered separately, both differences reached statistical significance, indicating that there were significant differences between the control and experimental groups' listening and speaking post-test scores.

Based on the gained results, the study contributes to the literature in three ways. First, it demonstrates that STEAM and language education can be effectively integrated and this combination leads to more learning gains. Second, it displays the role of technology, particularly instructional multimedia, in promoting language learners' ease of cognitive processes both in the domain of receptive and productive language skills. Third, it supports the advantages STEAM approach can offer to promote students' motivation in selecting more interesting topics to communicate orally in a foreign language.

DISCUSSION

The findings suggested that incorporating systematic multimedia input into STEAM instruction developed EFL learners' speaking and listening skills. The reason of this finding can be related to the type of technology-enhanced materials in presentation and practice phases of the lesson.

The main reason for these results can be attributed to the matter that multimedia can make boring and abstract content more exciting and vivid. Accordingly, by applying multimedia to STEAM instruction, the abstract ideas within STEAM topics, such as science and mathematics, have been changed into more concrete ones, and transferring knowledge has become more straightforward and explicit.

Another underlying reason is that multimedia makes learning more active and engaging. In addition, it has been shown that learning through multimedia in the form of videos improves learners' motivation and performance in online classes

Furthermore, it is supported in the literature that multimedia can reduce the cognitive load of the instruction, and it leads to the allocation of most cognitive resources of the working memory to the learning tasks.

To be more specific in terms of students' listening skills in this study, with the help of multimedia, the challenging topics of STEAM were changed into more concrete ones. Hence challenges were reduced, and listening comprehension increased. Regarding students' speaking skills, clips assisted learning in two ways: first, by supporting linguistic knowledge like vocabulary, lexical resources, and register, and second, by contributing to the activation of background knowledge.

SELECTED REFERENCES

Abdukabirova, D. I. Q. (2021). INTEGRATION OF STANDARD STEAM IN ENGLISH LANGUAGE CLASSROOMS. *Academic Research in Educational Sciences*, *2* , 584–587.

Banergee, S. (2016). STEM—A tool for teaching and learning a foreign language. *2016 IEEE Integrated STEM Education Conference (ISEC)*, 16–18.

Beatty, K. (2010). *Teaching & Researching: Computer-Assisted Language Learning* (2nd ed.). Routledge.

Bybee, R. W. (2010). *What is STEM education?* American Association for the Advancement of Science.

Wu, C., Tang, X., & Mou, T. (2019). Course design and teaching practice in STEAM education at distance via an interactive e-learning platform. *Asian Association of Open Universities Journal*, *14*(2), 122-133.

Choi, H. J., & Johnson, S. D. (2005). The effect of context-based video instruction on learning and motivation in online courses. *The American Journal of Distance Education*, *19*(4), 215–227.

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, *10*(4), 86.

Hasanah, U. (2020). Key definitions of STEM education: Literature review. *Interdisciplinary Journal of Environmental and Science Education*, *16*(3), e2217.

Richards, J. C. (2008). *Teaching listening and speaking* (Vol. 35, No. 4). Cambridge university press.