



Review Article

Exploring Pedagogical Approaches and Research Instruments in Technology-Enhanced Language Learning: A Systematic Review

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ABSTRACT

This systematic review explored how higher education institutions use technology-enhanced language learning. This evaluation follows PRISMA principles to identify the most pertinent studies from 2000 to 2022. These papers demonstrate a thorough examination of important aspects and effective tactics in ESL training. This review identifies common themes in the literature in three areas. Scholars mostly used task-based learning, communicative methods, flipped classrooms, and other techniques. The next part discusses data gathering methods such surveys, interviews, tests, forum group discussions, and observations. Finally, this work synthesizes a selection of current research articles. These studies provide a sophisticated knowledge of technology-enhanced language acquisition in higher education and a framework for additional research.

Keywords: TELL, PBL, ESL, pedagogical approach

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INTRODUCTION

Conventional teaching methods are often a discussion of the pros and cons (Li, 2016). It is seen as inadequate and boring by students, especially when teenagers are very active in using gadgets. In other words, technology has a huge impact on students' learning expectations and study habits. Besides, the use of information technology (IT) is now no stranger to being used in education. Schools are currently advised to increase the digitization of schools. So that many educators are trying to improve their IT skills, one of which is by participating in training workshops, workshops on learning applications, as well as IT-based teaching and learning methods. In conclusion, teachers with more computer experience are more confident in their abilities to use them effectively (Peralta & Costa, 2007).

Information and Communication Technology (ICT) has a significant impact on how people learn and get information or knowledge (Anas, 2019; Anas & Musdariah, 2018). This will help teachers facilitate language acquisition for their students while making the teaching and learning process more effective and efficient. The incorporation of ICT will aid educators in fulfilling the global demand to replace traditional teaching methods with technology-driven infrastructure and resources (Murdariah, 2023). Mwendwa (2017) says that the way a teacher uses technology depends on several things, such as how familiar they are with computers, how much time they have, and what hardware and software are available. Furthermore, technology is a vital part of teachers' lives since they can utilize it to help students learn. The critical aspect is to reconsider the idea of incorporating technology into the curriculum to enhance the teaching and learning process. Additionally, according to (Niiranen, 2021) technology assists students in becoming independent, developing research and problem-solving skills, and enjoying studying in general.

“TELL is an approach to promoting the students' learning engagement and participation”

The innovative application of methods, tools, materials, equipment, systems, and strategies directly related to English language education and contribute to accomplishing intended goals is usually recognized as the use of modern technology in English teaching. In addition, (Ahmadi, 2017) asserted that one of the essential aspects of learning is the way teachers employ to facilitate the language learning process in their classrooms. Several review studies on Technology-Enhanced Language Learning (TELL) were carried out. Ghanizadeh et al. (2015) examine the efficacy of technology in enhancing learning in general and language acquisition in particular. Jeffrey (2015) said that based on reviewing a book of Walker and White's book, they believe that instructors may be scared by changes in technology, or more precisely. Instructors cannot keep up with the changes in technology as quickly as their students can and hence are not comfortable integrating as diverse a range of technologies into their lessons (e.g., YouTube videos or audio recording and editing programs).

Unfortunately, language learning and teaching technologies are evolving so rapidly that we must be able to follow their uses and modifications. In addition, several technologies have become obsolete and are never utilized again. Therefore, it is necessary to conduct more regular reviews of the technologies employed to language learning and instruction and to examine past, current, and future practices. This review can serve as a guide for language students, lecturers, and researchers. In other words, if an educator wishes to know the kinds of pedagogical approaches in TELL, this review article can give important information about what the previous studies have used. Besides, this review paper also can provide the instruments that the researchers used to conduct the research and the result of the research. According to Machi & McEvoy (2012), review studies are an essential source of knowledge for the advancement of any scientific area since they give helpful synthesis and fresh ideas. We addressed the three research questions listed below: (1) What pedagogical approaches were utilized in the evaluated papers? (2) What are the most important research tools?

METHOD

Review method

To ensure credibility, papers were electronically and manually searched. To ensure credibility, papers were electronically and manually searched. This research employed publish or perish software for meta-analysis. Moher et al. (2015) suggested that PRISMA assists writers plan and reporting systematic reviews and meta-analyses. This systematic review uses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method, which consists of four processes: identification, screening, eligibility, and inclusion. PRISMA's comprehensiveness and versatility have made it popular among researchers.

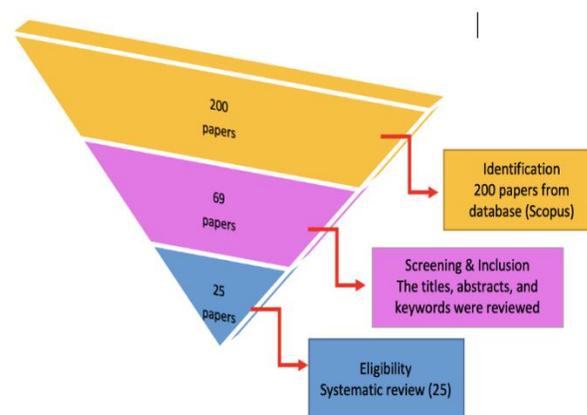


Figure 1. Pyramid of PRISMA

Following the PRISMA criteria, the systematic review begins with examining the identification procedure. The systematic review starts with evaluating the identification process, per PRISMA. The top studies from 2000 to 2022 compare crucial criteria and techniques. The first criterion for picking ESL and EFL TEFL papers. After identifying all

articles, the screening procedure begins by removing duplicates from several databases. Initial filtering left 131 articles. Abstracts and keywords were reviewed for relevance to TEFL, ESL, and EFL. This filtering method evaluated 62 publications not related to the study's goal. Nineteen books, 16 conference proceedings, four editorials, and five reviews remained. Using inclusion and exclusion criteria, 25 articles might be included. With 25 publications remaining, measures were utilized to choose more relevant papers that better illustrated TELL. Meanwhile based on 25 articles that have been reanalyzed, only 9 articles directly discuss the pedagogical approach used by previous researchers.

Article Screening

After a quick evaluation of the publications, it became evident that categorizing would be advantageous because they cover a wide variety of TELL-related subjects and use different methodologies. Using a classification form, the papers were coded to retrieve research data. Depending on the study's scope, researchers drafted this form. A language expert and two TELL or literature review experts assessed the proposed form. Also changed during data analysis.

Data Analysis

This study used a systematic search technique to discover papers that aligned with established review criteria using the "Publish and Perish" tool. Making use of the program's capacity to obtain and analyze raw citation data, scholarly papers were methodically retrieved and reviewed from several databases. The software offers important measures for citations, such as the number of publications, total citations, and h-index, which allow for a thorough assessment of the academic environment. The papers that were found were organized more efficiently with the help of tables, and the results of the content analysis could be better understood with the help of descriptive statistics. To tackle new problems with TELL, such as insufficient teacher training, academic dishonesty, and interruptions to students' learning, a comprehensive literature analysis was carried out. In addition, the review incorporates findings from non-empirical studies, which adds useful information that backs up the educational claims made in earlier studies. The combined data is a great starting point for future research and teaching strategies using technology-assisted language acquisition, as well as for drawing pedagogical conclusions.

RESULTS

Pedagogical Approach

The results revealed that the evaluated studies employed a range of educational strategies. Task-based learning was the technique with the most significant number of participants (n = 4 articles). It is a method of learning a language that is oriented on the student and places an emphasis on making meaningful use of the language being known in order to complete meaningful activities. Typically, the teacher assigns students a task that requires them to communicate in the target language. In [Bradley & Lomicka \(2000\)](#) and [Oh & Nussli \(2014\)](#), students built a contextualized TELL using a task-based approach. Meanwhile the other

pedagogical approaches were found such as authentic learning, communicative, flipped classroom, behavioral, and constructivism.

Table 1.
Results of literature searches

<i>Approaches</i>	<i>Journal (alphabetically)</i>	<i>Author (s) (Year)</i>
Task-based learning	CALICO Journal	(Egbert, 2009)
	Computers in Human Behavior	(Yang & Chen, 2007)
	International Journal on Advances in Life Sciences	(Oh & Nussli, 2014)
	J. Educational Computing Research	(Bradley & Lomicka, 2000)
Authentic Learning	EURASIA Journal of Mathematics Science and Technology Education	(Sasi et al., 2017)
Communicative	Australian Journal of Teacher Education	(Howard, 2017)
Flipped Classroom	Computer-Assisted Language Learning	(Webb & Doman, 2020)
Behavioral	Journal of Further and Higher Education	(Alavi et al., 2022)
Constructivism	Computer-Assisted Language Learning	(Rüschhoff & Ritter, 2001)

Emerging issues

Based on the table above, the emerging issues in task-based learning could be attributed to a lack of thorough investigations on the efficacy of distinct task-based learning methodologies across different educational environments. Additionally, there could be scope for examining the effects of task-based learning across various levels of language

proficiency or researching the potential integration of technology into task-based language instruction (Oh & Nussli, 2014).

The research gap in authentic learning may be filled by doing additional studies on the practical use of genuine learning methodologies in STEM (Science, Technology, Engineering, and Mathematics) education. Scholars may investigate the effects of authentic learning experiences on student motivation, achievement, and engagement in these disciplines (Sasi et al., 2017). According to them, using materials that are interesting to youngsters promotes learning and boosts comprehension of the subject. Providing real learning facilitated the social aspect of learning. Technology was both an activity facilitator and a learning incentive. Language and technology served as mediators to shape the learning encounter. The area of research that may be lacking in communicative language instruction pertains to the comprehension of precise pedagogical methodologies that augment communicative competence. Scholars may conduct investigations into the efficacy of communicative strategies across various language learning environments or examine the potential integration of technology into communicative language instruction (Howard, 2017). Besides, He also argues that a student must have a large vocabulary to apply speaking, listening, reading, and writing abilities. This is consistent with the communicative approach to language instruction utilized with students who develop communicative competence.

An area of research that has yet to be thoroughly investigated is the optimal methodology for incorporating flipped learning into language classrooms. This may encompass an examination of the influence of pre-class materials on students' level of readiness, an analysis of the function of instructor facilitation in flipped classrooms, and an evaluation of the flipped approach's enduring consequences on language acquisition (Webb & Doman, 2020). The flipped classroom pedagogical approach was discovered through a survey of online articles. TELL uses technology to enhance student autonomy and control over their learning. Reverse approaches to teaching and learning are one way to guarantee that technology is an integral part of inquiry-based classroom learning. Moreover, the area of research that remains unexplored in the behavioral approach could be the contribution of behavioral interventions to the success of college students. Scholars may undertake an inquiry into the efficacy of particular behavioral strategies in augmenting student learning outcomes, in addition to examining the enduring consequences of these interventions on both academic and personal growth (Alavi et al., 2022). Besides, further research could be conducted to determine how technology can be integrated into constructivist language learning environments in order to fill the research void in constructivism. Scholars may consider investigating the potential of digital tools to support collaborative and inquiry-based learning, as well as evaluating the effects of constructivist methodologies on heterogeneous learner cohorts (Rüschhoff & Ritter, 2001). Additionally, there are two participants in the research benefited from behavioral approach. Alavi et al. (2022) states that while technology-enhanced assessment has a favorable effect on the performance of students, students have diverse views regarding e-assessment that must be examined in future research. The students give positive responds of the e-assessment. While Zhang et al. (2022) claim that teachers may affect the adoption of technology-enhanced collaborative

writing through cognitive, metacognitive, behavioral, and motivational factors. Future studies might focus on teacher preparation, student autonomy, and the size of writing groups. Besides, in constructivism approach, there is one participant. Over the last decade, language learning theory has shifted from a highly directed to a more open learning environment, with constructivism emerging as a new and extremely student learning paradigm. Learning is viewed as a self-directed and self-directed process of knowledge creation, and the learner is viewed as a self-directed knowledge creator (Rüschhoff & Ritter, 2001).

DISCUSSION

The study looks at a range of pedagogical approaches to language learning research, with a focus on task-based learning, authentic learning, communicative language education, the flipped classroom, behavioral techniques, and constructivism. Task-based learning is the technique that is most frequently utilized, which indicates its widespread acceptance and recognition in the field of language education. Nevertheless, a meticulous analysis of the research void reveals particular domains that necessitate additional investigation within every pedagogical methodology. There is a dearth of exhaustive research examining the effectiveness of different methodologies in task-based learning across a range of educational contexts. Oh and Nussli (2014) call attention to the integration of technology into task-based language instruction, which emerges as a promising area for further investigation. As highlighted by Sasi et al., (2017), authentic learning highlights a knowledge gap regarding the implementation of genuine learning methodologies in STEM education. This necessitates further research to investigate the impact of these experiences on student motivation, achievement, and engagement in STEM fields. There is a knowledge gap regarding precise pedagogical methodologies that improve communicative competence in the context of communicative language instruction. This necessitates that scholars examine the effectiveness of communicative strategies in various language learning environments and consider the possibility of integrating technology, in line with the insights provided by Howard (2017). Concerning the most effective methodology for integrating flipped learning into language courses – including analyses of pre-class materials, the instructor's facilitation role, and the long-term effects on language acquisition – the flipped classroom approach creates a research void (Webb & Doman, 2020). The research lacuna within the behavioral approach pertains to the extent to which behavioral interventions contribute to the achievement of college students. This has motivated scholars to investigate the effectiveness of particular strategies and analyze the long-term effects on both academic achievement and personal development (Alavi et al., 2022). The area of constructivism where additional research is needed is technology integration; this calls for a deeper examination of digital tools that facilitate collaborative and inquiry-based learning, as well as an assessment of their effects on learner cohorts that are heterogeneous (Rüschhoff & Ritter, 2001).

Furthermore, the discourse encompasses research instruments, demonstrating an all-encompassing methodology through the utilization of a variety of tools such as assessments, questionnaires, interviews, forum group discussions, and observations. The implementation of sophisticated technologies, exemplified by the Advanced Joint English Teaching (AJET)

software, signifies a dedication to pioneering data gathering methods. Additionally, the use of unique instrument sets customized for various participant cohorts exemplifies astute research design, thereby augmenting our nuanced comprehension of the efficacy of language learning within the ever-evolving domain of education research.

Based on these findings, the following are some recommendations for future researchers in the subject. Initially, a number of studies failed to identify the pedagogical approaches employed in TELL design. Therefore, it is advocated that such crucial information be made public. Second, the researchers in this study found that the majority of studies employed survey, review, and experimental research methods, indicating that several types of data might be collected. For example, physiological data may be collected using wearable sensor technologies, and correlations between the data and TELL can be explored to develop the field. Thirdly, a number of research issues were identified at TELL, such as the types of technological tools and the tendency toward new technology in education. The subsequent researchers can use TELL to construct integrated courses for ESL and EFL students.

CONCLUSION

Informed by the review results, TELL has the potential to promote the student engagement in the teaching and learning process. Several review studies on technology-enhanced language learning (TELL) have been undertaken up to this time. The discussion emphasizes research instruments, including assessments, questionnaires, interviews, forum group discussions, and observations. Innovative data collection approaches, such as the Advanced Joint English Teaching (AJET) software, demonstrate complex study design and a deep grasp of language learning efficacy. Future researchers should publicize Technology-Enhanced Language Learning (TELL) pedagogical approaches, explore diverse data collection methods, including physiological data, and address research issues like technological tools and their incorporation into integrated ESL and EFL courses. This study emphasizes the dynamic relationship between methodology, technology, and learner results, laying the framework for language education research innovation.

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CONFLICT OF INTEREST

No conflict of interest reported by the author(s)

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