

Utilization of Instructional Technology in English Language Teaching (ELT) based on Constructivism: A Literature Review

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Abstract

This literature review paper explores the realm of constructivism within educational environments, specifically focusing on the use of instructional technology in English Language Teaching (ELT) for higher education. The scope of instructional technology in this paper is any kinds of technological support designed to accommodate various learning opportunities for learners by providing multiple tools or means of engagement, representation, and expression in ELT. Meanwhile, Constructivism, a prominent learning approach having been used widely in educational realm, underscores learners' active participation in constructing their own knowledge through experiences and interactions with their surroundings. Constructivism emphasizes the importance of authentic tasks and meaningful contexts in fostering knowledge transfer. The roots of constructivism trace back to Vygotsky's sociocultural theory, highlighting the role of social interactions and tools in cognitive development. The paper aims to examine how instructional technology can facilitate constructivist principles in ELT, examining global trends, knowledge acquisition, and the interplay between technology and constructivist pedagogy. The paper makes use of literature review for the methodology, based on a systematic review approach to gather and analyze relevant scholarly articles, books, reports, and conference papers concerning how instructional technology is used to employ constructivism in English Language Teaching (ELT), in higher education settings. The review also dives into practical implications and recommendations for leveraging instructional technology as scaffolding for language learners to navigate their Zone of Proximal Development effectively. Eventually, the integration of instructional technology within constructivist pedagogy presents rooms for establishing dynamic and interactive learning environments. However, thoughtful attention must be given to teaching and learning strategies, teacher support, and effective synergy of technology to obtain its full potential in enhancing student learning.

Keywords: constructivism, instructional technology, English Language Teaching

1. Introduction

This literature review explores key concepts, principles, and implications of constructivism in educational settings, particularly in the context of instructional technology and English Language Teaching (ELT) in higher education. The instructional technology covers all sorts of technological support for ELT ranging from using digital text, audio, video, and interactive media to present information; providing illustrations, diagrams, or animations to support learning (Kesler et al., 2022; Lisenbee et al., 2020). Constructivism itself is a prominent learning theory that emphasizes learners' active role in constructing their own understanding and knowledge based on their experiences and interactions with the environment. Ertmer & Newby (2013) argue that constructivism does not deny the existence of the real world but emphasizes that learners create meaning through their interpretations of experiences. This perspective highlights the importance of authentic tasks and meaningful contexts in facilitating knowledge transfer (Ertmer & Newby, 2013). Similarly, Duffy and Jonassen (1992) suggest that constructive learning environments are most effective for advanced knowledge acquisition, where learners can negotiate and modify misconceptions.

The root of constructivism is the sociocultural theory proposed initially by Vygotsky (1978). This sociocultural theory emphasizes the role of social interactions and tools in cognitive development. Vygotsky's Zone of Proximal Development (ZPD) concept underscores the importance of scaffolding and peer collaboration in guiding learners towards higher levels of understanding (Leontjev & Pollari, 2023). It can be said that there is an interconnection between the human cognitive process and the environment. Human makes meaning with the help of the environment and the environment receives significant influences from the human (Vygotsky, 1978).

To What Extent the Instructional Technology Have Been Supporting ELT

In the more recent context, technology plays a crucial role in implementing constructivist principles. One condition in constructivist learning environment is dynamic learning environment. This kind of environment is signaled by flexibility in learning, adaptivity and responsiveness to the needs, interests, and abilities of learners (Kapur, 2019; Ryoo & Bedell, 2017; Zhang & Zou, 2022). The dynamic leaning environment is facilitated by the use of instructional technology since it utilizes various resources and instructional strategies to create an engaging and interactive learning experiences (Ahmad et al., 2020; Kim, 2020). Numerous modifications have been implemented to incorporate and tailor the use of technology in education, notably in the application of constructivism. Laptinova (2021), for instance, outlines four essential principles for effective constructivist learning, including replicating real-life communication practices, encouraging reflective observation, leveraging prior experiences, and minimizing Teaching Talk Time (TTT). In the same line, previously, Hora and Holden (2013) have emphasized the need to examine how instructional technology has been used to elicit cognitive engagement and support pedagogical techniques in the classroom.

In order to elaborate how constructivism can be implemented in this era, this paper is intended to review a range of literature concerning the utilization of technology in educational instructions for English Language Teaching. The initial part reviews the global phenomenon of how instructional technology has been used in Language Teaching. The elaboration is continued by

discussing the concept of knowledge acquisition in the light of constructivism, how the constructivists play its roles in Language Teaching and Learning, and how the instructional technology has been used in constructivism context. The paper then continues to discuss how researchers have investigated the use of technology in Language Teaching and Learning using constructivism approach and the practical impacts. The final part is the conclusion and some recommendation concerning the issue. This review would bridge the concept of ZPD and the use of instructional technology in English language teaching (and learning); It is also expected that the review would enlighten how the instructional technology can function as a scaffolding for the language learners so that they manage to go through their ZPD, to the higher level of learning.

Constructivist Principles in Language Teaching and Learning

Lapinova (2021) has outlined important principles for constructivist language teaching and learning, namely replicating real-world experiences, encouraging reflective observation and abstract conceptualization, leveraging prior knowledge, and minimizing Teaching Talk Time (TTT). These principles align with the broader constructivist framework, emphasizing hands-on, experiential learning and active student engagement in language acquisition.

The literature reviewed underscores the transformative potential of constructivist approaches in education, particularly in fostering critical thinking, collaboration, and meaningful learning experiences (Ahmad et al., 2020; Leontjev & Pollari, 2023; Liu et al., 2020; Mensah, 2015). Constructivism emphasizes that the “situation” is essential and triggers students’ initiative and enthusiasm to enter the atmosphere of learning with interest, activating their critical thinking. Meanwhile, “collaboration” emphasizes the interaction between the learners or students, teacher and students, and students and the teaching media. How learners’ Zone of Proximal Development (ZPD) appearing in peer interaction can be assessed by the teacher is informed by the understanding that mediation in learning. Peer interaction or collaboration can create possibilities for the learner to internalize learning (Leontjev & Pollari, 2023). Using that principle outlined, teachers could mediate their learners, such as in second or foreign language writing, building on peer assistance while finishing their writing project (Leontjev & Pollari, 2023). Next on the list, “meaning construction” is the result of students’ exploration and completion the construction of meaning to obtain their own goal of learning, focuses on a student's ability to build a mental meaning and to construct their own learning (Yasseen Shukr & Adnan Jameel, 2022). These aspects are crucial in language teaching and learning since they would replicate the extra linguistic reality (Lapinova, 2021). With the scaffolding implementation, in the spirit of constructivism, students do not merely copy what the teacher said but show their ability to use second or foreign language as a tool to present objects and ideas, to enable the target language learning process (Kim, 2020).

Digging deeper into making meaning in constructivism learning, this notion somehow is overlapping with the idea of becoming autonomous language learners, which is important in achieving the goal of second language or foreign language learning. In learning languages, the learners are expected to develop autonomy of learning so that learning can take place anywhere and anytime (Chong & Reinders, 2022; Hammoodi & Alishah, 2020). Successful language learning is happening when the learners are able to use and improve his or her language usage and learning autonomously. These language learners can produce language by themselves through

interpersonal cooperation in the context of corresponding learning environment (Chong & Reinders, 2022; Wang & Zhang, 2022; Zhang & Zou, 2022).

Role of Instructional Technology in Constructivist Language Teaching and Learning

The integration of instructional technology within constructivist frameworks has been a topic of interest for researchers. Hora & Holden (2013) emphasize the need to go beyond mere usage statistics of technology in classrooms and focus on how these tools are deployed to enhance student cognitive engagement, support pedagogical techniques, and interact with teaching dimensions over time. A study by Singh (2019) reveals that the learners got highly motivated in learning because the use of multimedia technology could hold their attention during the classroom instruction. The use of technology in giving educational instructions brings a new atmosphere and situation in the teaching and learning context. This is especially true as Liu et al (2020) point out that the “situation” is crucial to rise the students’ initiative and enthusiasm, to engage learning in the atmosphere of study circumstance with interest.

Feyzi Behnagh and Yasrebi (2020) highlight the potential of constructivist educational technologies in promoting active critical inquiry and knowledge construction among learners. However, they also caution that the effectiveness of these technologies depends on productive utilization and teacher guidance to ensure meaningful learning experiences. In the same light, a research by Kim (2020) addresses the potential of digital technology in supporting and scaffolding English Learners’ efforts to connect specific experience with students’ understanding. Kim (2020) argues while class discourse alone did not show opportunities for English Learners to link specific phenomenon to a certain learning concept, instructional technology has the potential to encourage learners to effectively connect the text being learned to the actual learning processes has become obvious, for example, when the learners watch an educational video clip. In other words, the use of instructional technology plays an important role as a tool for learning mediation, connecting textual and academic meaning with the students’ personal understandings, and shaping the learning concepts. This exemplify one way of enhancing the target learning personally by the learners, which is by using visualisation.

Moreover, instructional technology has made possible more attractive ways to create visualisation in learning which in turns can scaffold the process of learning internalization, or ‘making meaning’ while learning. A study conducted by Ryoo and Bedell (2017) demonstrated the significant effect of interactive dynamic visualizations for English Learners linguistically compared to the mainstream classrooms. The study explored the effects of visualizations augmented by carefully designed scaffolding approaches during web-based inquiry instruction using knowledge integration. This study also revealed that a range of factors can also impact students’ learning with visualizations, such as context, design features, content, instructional guidance, and individual characteristics (Ryoo & Bedell, 2017). One language skill greatly affected by visualisation technology is reading. In particular, Zuo and Ives (2023) conducted a study in TARI (Technology Assisted Reading Instruction). They found out TARI can enhance reading motivation, foster collaborative learning, provide scaffolding, improve reading performance. The use of technology in reading is also able to expand selection of resources (Lisenbee et al., 2020). The digitalization and advancement in technology of educational instruction in language teaching and learning have significantly advanced reading instruction for English Language Learners (Zuo & Ives, 2023).

2. Method

This literature review has been conducted based on a systematic approach to gather and analyze relevant scholarly articles, books, reports, and conference papers concerning how instructional technology is used to employ constructivism in English Language Teaching (ELT), in higher education settings. The methodology follows a structured process outlined in the following part. The initial step involved identifying key terms and phrases related to the research topic. Keywords such as "constructivism," "instructional technology," "English Language Teaching," "higher education," "Vygotsky," "sociocultural theory," "knowledge transfer," "Zone of Proximal Development," and "dynamic learning environments" were used to guide the searching process. The next step is a comprehensive search, conducted across various academic databases, including but not limited to Google Scholar, ERIC, JSTOR, and ScienceDirect.

Then, articles and publications were screened based on predefined inclusion and exclusion criteria. Inclusion criteria encompassed peer-reviewed studies published within the last ten years (2014-2024) that specifically addressed constructivism, instructional technology in ELT for higher education, and their interrelation. Exclusion criteria included non-English publications, duplicates, and materials lacking empirical or theoretical grounding. After that, screening and selection took place. The retrieved literature was screened based on titles, abstracts, and keywords to determine relevance. Full-text articles meeting the inclusion criteria were selected for further analysis. The screening process was conducted independently by two researchers to ensure consistency and minimize bias.

The following step is due to extraction of relevant data from selected articles, including research objectives, methodologies, key findings, theoretical frameworks, and practical implications. Data synthesis involved categorizing and organizing extracted information according to thematic areas such as constructivist principles, instructional technology integration, pedagogical strategies, and student outcomes. A critical appraisal of the synthesized literature was conducted to evaluate the strengths, limitations, and implications of the findings. This analysis involved identifying common themes, theoretical perspectives, methodological approaches, and gaps in existing research.

Based on the reviewed literature, a conceptual framework was developed to illustrate the relationships between constructivism, instructional technology, and ELT in higher education. The framework explains the key concepts, theoretical underpinnings, and practical strategies for leveraging technology to support constructivist pedagogy. The findings of the literature review were synthesized into a coherent narrative, supported by evidence from the analyzed sources. The paper underwent multiple revisions to ensure clarity, coherence, and alignment with the research objectives and theoretical framework. By employing this systematic methodology, the literature review paper provides a comprehensive analysis of constructivism in educational environments, with a specific

focus on the role of instructional technology in enhancing ELT practices for higher education learners.

3. Findings and Discussion

The studies presented in this review highlight the foundational principles and theoretical backgrounds of constructivist epistemology, emphasizing active learners' engagement, contextualized learning experiences, and collaborative knowledge construction. Generally, it has been observed that the students or the learners are able to make meaning personally for themselves and they are supported to engage more with the learning concept. These learners are also encouraged to have more peer collaboration to enrich their learning experience and eventually enhancing their mastery towards the learning concept.

Here is the table summarizing the review based on the topic, theoretical framework, methodology, and key findings.

Table 1 summary of the literature review

Number	Source	Theme/ Topic	Theoretical Framework	Methodology	Key Findings
1	(Aljohani, 2017; Ertmer & Newby, 2013)	Constructivist Epistemology	Constructivism	Various (e.g., qualitative, mixed methods)	- Emphasizes active learners' engagement, contextualized learning experiences, and collaborative knowledge construction. - Integration of instructional technology enhances student learning outcomes and promotes exploration. - Challenges include effective teacher guidance, appropriate use of educational technologies,

					and designing authentic learning tasks.
2	(Ahmad et al., 2020; Hora & Holden, 2013; Mensah, 2015; Singh, 2019)	Innovative Pedagogical Practices	Constructivism, Instructional Technology	Research exploration, theoretical analysis	- Exploration needed to improve collaboration between constructivist principles, instructional technology, and effective teaching strategies. - Technology integration requires effective pedagogical strategies and teacher support.
3	(Leontjev & Pollari, 2023; Ryoo & Bedell, 2017; Zuo & Ives, 2023)	Zone of Proximal Development (ZPD)	Zone of Proximal Development (Vygotsky)	Research studies, conceptual analysis	- Scaffolding and peer collaboration are crucial for guiding learners towards higher understanding. - Further research needed to explore effective strategies for assessing and leveraging ZPD in language learning contexts.
4	(Zhang & Zou, 2022;	Technology Assisted	Constructivism, Instructional Technology	Experimental studies,	- TARI enhances reading motivation,

	Zuo & Ives, 2023)	Reading Instruction		qualitative analysis	fosters collaborative learning, provides scaffolding, improves reading performance, and expands semiotic resources.
					- Technology has a transformative role in promoting literacy skills among ELLs.
5	(Ahmed & Dakhiel, 2019; Anagiün, 2018; Zhang & Zou, 2022)	Learner-Centered Teaching Approaches	Learner-Centered Approaches, Instructional Tech	Empirical research, case studies, surveys	- Learner-centered teaching coupled with technology integration increases engagement, speaking time, and autonomous interaction.
					- Technology facilitates the transition to flexible instructional structures and empowers educators to design personalized learning experiences.
6	(Lisenbee et al., 2020)	Multiliteracy and Technology Integration	Multiliteracy, Instructional Technology	Literature review, theoretical	- Technology integration aligned with multiliteracy

	framework analysis enhances various communication skills (e.g., reading, writing, listening, speaking, viewing, visually representing).
	- Equips language learners with tools to navigate diverse forms of communication in contemporary society.

The integration of instructional technology within constructivist frameworks offers exciting opportunities for enhancing student learning outcomes and promoting more exploration. Instructional technology can minimize the barriers for literacy by providing more support to bridge literacy. Instructional technology also leverages learning to the higher level with more authentic experiences and more personalized ones. (Aljohani, 2017; Lisenbee et al., 2020). The use of learning management system, interactive media (video and audio as well as digital text), various search engines and real time chat systems bring learning into more interactive, authentic, and personalized. Meanwhile, challenges such as the need for effective teacher guidance, the appropriate use of educational technologies, and the design of authentic learning tasks remain crucial considerations (Ertmer & Newby, 2013).

Additionally, there is also an urgent need on exploring innovative pedagogical practices that improve the collaboration between constructivist principles, instructional technology, and effective teaching strategies to maximize student engagement and learning outcomes (Hora & Holden, 2013; Mensah, 2015). Consequently, constructivism in English Language Teaching (ELT) involves creating authentic learning experiences, promoting collaborative and reflective practices, and empowering students to construct their knowledge (Ahmad et al., 2020; Zuo & Ives, 2023). Technology integration can enhance these practices but requires effective pedagogical strategies and teacher support (Singh, 2019).

As the central part of constructivism, the zone of proximal development (ZPD) concept underscores the importance of scaffolding and peer collaboration in guiding learners towards higher levels of understanding (Leontjev & Pollari, 2023). However, further research is needed to explore effective strategies for assessing and leveraging ZPD in language learning contexts (Ryoo & Bedell, 2017). Recently, instructional technology

has revolutionized English Language Teaching (ELT) by intervening into the ZPD, offering innovative approaches and tools to enhance learning outcomes. One such technology is Technology Assisted Reading Instruction (TARI), which has shown significant potential in ELT. According to Zuo & Ives (2023), TARI can bolster reading motivation, foster collaborative learning environments, provide scaffolding, improve reading performance, and expand semiotic resources. This multifaceted impact highlights the transformative role of instructional technology in promoting literacy skills among English Language Learners (ELLs) in the digital age.

Furthermore, the shift towards learner-centered teaching approaches has been supported by instructional technology. Ahmed & Dakhiel (2019) emphasize the effectiveness of learners' centered-teaching, where students engage more with their peers, leading to increased speaking time and autonomous interaction. This approach, coupled with technology integration, empowers students to take ownership of their learning experiences and actively participate in language acquisition processes. Moreover, the evolution of technology has facilitated the transition from traditional to flexible instructional structures, as noted by Zhang & Zou (2022). Mobile technology, in particular, has democratized access to learning resources, minimizing temporal and spatial constraints and fostering a learner-centered paradigm. This adaptability and accessibility empower educators to design engaging and personalized learning experiences that cater to the diverse needs and learning styles of ELLs. Similarly, constructivist learning environments, as discussed by Anagün (2018), promote active engagement and sense-making among students, aligning with the interactive and collaborative nature of technology-assisted learning platforms.

In the meantime, the integration of technology in educational instruction, including language teaching and learning, so far has been aligned with the concept of multiliteracy, which has become essential in the contemporary landscape as mentioned by Lisenbee et al. (2020), literacy encompasses various modes of communication beyond traditional written skills like reading and writing, as well as oral skills, listening, speaking. Literacy also deals with viewing and visually representing information. Therefore, incorporating technology into educational instruction not only enhances written and oral skills but also equips language learners with the necessary tools to navigate diverse forms of communication prevalent in today's society.

4. Conclusion

In conclusion, the literature review underscores the significance of constructivist approaches in fostering meaningful learning experiences and cognitive development among learners. By emphasizing active engagement, collaboration, and contextualized learning, constructivism offers a robust theoretical framework for designing effective educational practices.

The integration of instructional technology within constructivist pedagogy, therefore, presents opportunities for creating dynamic, interactive learning environments. However, careful attention must be directed to pedagogical strategies, teacher support, and the meaningful integration of technology to dig up its full potential in enhancing student learning. Constructivism has offered valuable insights into effective teaching and learning practices in ELT contexts. Moreover, integrating instructional technology can enhance constructivist principles. However, it requires careful planning, teacher training, and ongoing institutional and educational policy makers' support. Further research can explore more innovative approaches to scaffold learning, assess ZPD, and leverage technology effectively in constructivist ELT environments.

So far, instructional technology has been proven to be able to create more learners or students' engagement as long as they have been provided with sufficient support (scaffolding) by the teachers or the facilitators. The types of instructional technology used have been various, yet they have managed to help the learning as long as there is still proper intervention. There has not been enough information regarding which type of technology would likely giving more support to a certain learning condition. In the long run, future research should focus more on investigating the impact of specific instructional technology tools on constructivist learning outcomes in diverse educational contexts and exploring innovative pedagogical strategies that combine constructivist principles, educational technology, and teacher guidance to optimize student engagement and knowledge construction. In addition to methods in ELT, researchers can also examine the role of collaborative learning environments and peer interactions in facilitating constructivist approaches to teaching and learning. Collaborative learning has been investigated to be properly aided by the use of instructional technology in learning. To wrap up the research issues, conducting longitudinal studies to assess the long-term effects of constructivist pedagogy and technology integration may impact greatly on the learners' academic achievement and skill development.

References

- Ahmad, R., Ahmad, R., Sagir, M. I., & Jaafar, T. J. (2020). Paradigm of shift in assessment: Constructivist and instructional technology model. *Journal of Critical Reviews*, 7(8), 1394–1397.
- Ahmed, S. A., & Dakhiel, M. A. (2019). Effectiveness of Learner-Centered Teaching in Modifying Attitude Towards EFL and Developing Academic Self-Motivation Among the 12th Grade Students. *English Language Teaching*, 12(4), 139. <https://doi.org/10.5539/elt.v12n4p139>
- Aljohani, M. (2017). Principles of Constructivism on Foreign Language Teaching. *Journal of Literature and Art Studies*, 7(1), 97–107.

- Anagün, Ş. S. (2018). Teachers' Perceptions about the Relationship between 21st Century Skills and Managing Constructivist Learning Environments. *International Journal of Instruction*, 11(4), 825–840. www.e-iji.net
- Chong, S. W., & Reinders, H. (2022). Autonomy of English language learners: A scoping review of research and practice. *Language Teaching Research*. <https://doi.org/10.1177/13621688221075812>
- Duffy, T. M., & Jonassen, D. H. (1992). Constructivism: New Implication for Instructional Technology. In T. M. Duffy & D. H. Jonassen (Eds.), *Constructivism and the Technology of Instruction: A Conversation*. Lawrence Erlbaum Associates, Inc., Publishers.
- Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, Cognitivism, Constructivism: Comparing Critical Features from an Instructional Design Perspective. *Performance Improvement Quarterly*, 26(2), 43–71. <https://doi.org/10.1002/piq>
- Feyzi Behnagh, R., & Yasrebi, S. (2020). An examination of constructivist educational technologies: Key affordances and conditions. *British Journal of Educational Technology*, 51(6), 1907–1919. <https://doi.org/10.1111/bjet.13036>
- Hammoodi, S., & Alishah, A. R. (2020). The Evolvement of Autonomous Learning through Social Constructivist Movement. *Egitim Fakultesi Dergisi*, 6(1), 91–105.
- Hora, M. T., & Holden, J. (2013). Exploring the role of instructional technology in course planning and classroom teaching: Implications for pedagogical reform. *Journal of Computing in Higher Education*, 25(2), 68–92. <https://doi.org/10.1007/s12528-013-9068-4>
- Kim, H. Y. (2020). More than tools: Emergence of meaning through technology enriched interactions in classrooms. *International Journal of Educational Research*, 100(February), 101543. <https://doi.org/10.1016/j.ijer.2020.101543>
- Laptinova, Y. (2021). Constructivist Delivery Mode for Academic English Students. *Norwegian Journal of Development of the International Science*, 53, 43–45.
- Leontjev, D., & Pollari, P. (2023). Guiding and assessing development of L2 writing process: the role of peer collaboration. *Innovation in Language Learning and Teaching*, 17(2), 440–452. <https://doi.org/10.1080/17501229.2022.2058514>
- Lisenbee, P. S., Pilgrim, J., & Vasinda, S. (2020). *Integrating Technology in Classroom* (P. S. Lisenbee, J. Pilgrim, & S. Vasinda (eds.)). Taylor & Francis. <https://doi.org/10.4324/9780429340154>
- Liu, Y., Liu, H., Xu, Y., & Lu, H. (2020). Online English Reading Instruction in the ESL Classroom Based on Constructivism. *Journal of Educational Technology Systems*, 48(4), 539–552. <https://doi.org/10.1177/0047239519899341>

- Mensah, E. (2015). Exploring Constructivist Perspectives in the College Classroom. *SAGE Open*, 5(3). <https://doi.org/10.1177/2158244015596208>
- Ryoo, K., & Bedell, K. (2017). The effects of visualizations on linguistically diverse students' understanding of energy and matter in life science. *Journal of Research in Science Teaching*, 54(10), 1274–1301. <https://doi.org/10.1002/tea.21405>
- Singh, R. (2019). Students' perspectives on technology integration in ELT. *Journal of NELTA*, 24(1–2), 95–106. <https://doi.org/10.3126/nelta.v24i1-2.27682>
- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes* (M. Cole, V. J. Steiner, S. Scribner, & E. Souberman (eds.)). Harvard University Press.
- Wang, X., & Zhang, W. (2022). Improvement of Students' Autonomous Learning Behavior by Optimizing Foreign Language Blended Learning Mode. *SAGE Open*, 12(1). <https://doi.org/10.1177/21582440211071108>
- Yasseen Shukr, H., & Adnan Jameel, T. (2022). Digital Technology in English Language Teaching and Learning. *NTU Journal for Administrative and Human Sciences (JAHS)*, 2(2), 164–177. <https://doi.org/10.56286/ntujahs.v2i2.240>
- Zhang, R., & Zou, D. (2022). Types, purposes, and effectiveness of state-of-the-art technologies for second and foreign language learning. *Computer Assisted Language Learning*, 35(4), 696–742. <https://doi.org/10.1080/09588221.2020.1744666>
- Zuo, X., & Ives, D. (2023). Technology-Assisted Reading Instruction for English Language Learners: A Methodological Review. *ECNU Review of Education*, 1–25. <https://doi.org/10.1177/20965311231179490>