

Technology Enhanced Language Learning Research Trends and Practices: A Systematic Review (2020-2022)

Nurkhamimi Zainuddin

Faculty of Major Language Studies, Universiti Sains Islam Malaysia, Malaysia

khamimi@usim.edu.my

Abstract: In recent years, the role of technology in language classrooms has grown in importance. Due to recent developments in the education sector, technology-enhanced language learning (TELL) has come into the spotlight. Previous studies have shown that technology encourages both instructors and students to take an active role in the language learning process. In light of the widespread adoption and enabling power of immersive technologies and the potential applications of TELL, it is imperative that the literature be continuously investigated to identify the types and tendencies of recent studies in order to understand current practises and guide future research in the field with two research questions; RQ1: What are the trends and practices of TELL in language teaching and learning? and RQ2: What are the research methodologies employed in TELL studies? This review carefully examines the overall research trends and practises in language education in order to chart the development of TELL during the past few years. Out of 87 publications found in 2020–2022, 17 were selected using exclusion and inclusion criteria from Web of Science (WoS) and Scopus. Using five codes obtained from previous systematic reviews, we performed an analysis and synthesis of these publications. The codes are: 1) aim, 2) methodology, 3) sample, 4) country, and 5) outcomes. The bulk of the studies used a quantitative research technique to look into TELL trends and practises in language teaching and learning, and the systematic review found that TELL was more widespread in universities than in other types of schools, with the lowest occurrence seen in primary schools. In light of these findings, suggestions for more investigation were made. Academicians are urged to broaden the scope of future study and include students from all levels of education in future TELL practises in order to better understand TELL's usage in language teaching and learning.

Keywords: Technology enhanced language learning, Systematic review, Language teaching and learning, Trends, Practice

1. Introduction

Over the past few decades, the exponential growth of technology has held promise as a tool for improving language instruction. The fast development of technology has allowed for the testing of several potential approaches to teaching and learning languages. It has been proven that the usage of technology may help people learn a new language. Teachers of foreign languages have used a variety of technological tools to help their pupils learn the language and culture more effectively through exposure to real-world applications. As a result, certain technological resources allow educators to modify lesson plans, tasks, and projects for the benefit of their language learners. It also helps teachers of foreign languages facilitate and mediate their students' language acquisition. Teachers of languages who are also adept at managing and facilitating technology-enhanced language learning environments are critical to the success of any initiative to integrate such tools into the classroom.

The benefits of TELL have been highlighted by Carr et al. (2011), Chirimbu and Tafazoli (2013), Patel (2014) and Yeşilel (2016). Hence, the field has received a great deal of attention. TELL gives people the chance to link together many sources of knowledge and educational resources. Teens and young adults nowadays have unrestricted access to state-of-the-art technologies that are rapidly evolving and improving their capacity for communication and education. As a result, it is efficient to employ technology that is relevant to their daily lives.

Societies nowadays impose harsh expectations on people in many facets of life. All of these requirements point to fundamental skills that people must develop. Competency goes beyond merely having the right information and abilities. Ability to draw from and mobilise one's psychosocial resources, such as one's talents and attitudes, to successfully fulfil complicated demands in a given setting (Sumter et al., 2021; Kipper et al., 2021). One example of a competency is the capacity to communicate effectively, which might call upon a person's linguistic prowess, their experience with actual communication situations, and their perspective on the people with whom they are conversing.

Phonetics, grammar, vocabulary, reading, writing, translation, auditory comprehension, literature appreciation, and assessment are all areas where Tseng (2019) believes technology may make a significant impact on language acquisition. Vocabulary learning using technology, according to Asllani and Paçarizi (2021), may be adaptable and efficient. With the steady improvement of Internet-based technology over the past several years, more and more people are turning to it to increase their English vocabulary.

2. Literature Review

2.1 Technology-Enhanced Language Learning (TELL)

Taking a broad view of technology and its effects on language instruction, TELL is the research of its application in education (Yeşilel, 2016). Park (2022) stated that TELL is "the use of computers as a technical innovation to show multimedia as a means of supplementing teaching [methods]" (Patel, 2014, pp.1). The primary objective of this field of study is to advance and enhance language learning by the application of various forms of technology (Golshan and Tafazoli, 2014; Hubbard, 2013; Yeşilel, 2016). The use of technology in teaching a new language is multifaceted. It has several applications, including as a teaching tool, a means of distribution, and a means of boosting efficiency (Ghanizadeh, Razavi and Jahedizadeh, 2015). Students with diverse learning styles, backgrounds, and interests can benefit greatly from the scaffolding provided by technology (Fuente, 2021). Technology Enhanced Language Learning (TELL) promotes computer-mediated communication (CMC) to improve students' linguistic competence in a targeted foreign language (Kranthi, 2017).

There are benefits and drawbacks of using TELL. The benefits of language education and learning are numerous (Carr et al., 2011; Chirimbu and Tafazoli, 2013; Patel, 2014; Yang and Chen, 2007). It caters to a wider variety of learning methods and student demands than traditional textbooks do, and it gives a far more in-depth experience overall. Through TELL, students are able to set their own learning goals, determine their own pace, and choose their own content, all of which contributes to a greater sense of freedom and autonomy. Technology-related activities become more analogous to real-world circumstances, which in turn boosts student engagement and motivation. This makes it much simpler for students to immerse themselves in the target language and culture, allowing them to widen their understanding of the world, acquire new languages, and appreciate other cultures.

There are benefits to deploying TELL, but there are also drawbacks to think about (Penado Abilleira et al., 2021; Ghory and Ghafory, 2021; Kulikowski, Przytuła and Sułkowski, 2022). Before implementing TELL in the classroom, both educators and students need a foundational understanding of technological concepts. The ability to lead students in the use of technology in language learning depends on teacher's familiarity with the usage of technology. Second, it might be difficult to work online materials into an effective language course. Third, students tend to pay more attention to the tools and resources available to them than they do to the material being taught. Therefore, the results of student's use of technology run counter to what would be desired by the educator. Finally, problems with technology might interrupt the flow of language classes. Unfortunately, digital technology is not backed up, so its use might be compromised in the event of a power outage or other emergency.

Previous studies have shown that technology creates a level playing field for students (Shomirzayev, 2021; Hermanto and Srimulyani, 2021; Fung et al., 2022). In the case of language study, for instance, online discussion threads may inspire students to share their thoughts and receive constructive criticism (Sandoval-Cruz, 2022). In a nutshell, TELL encourages both instructors and students to take an active role in the language learning process. Students of all ages have a natural curiosity and excitement for the possibilities presented by modern learning tools. Teachers of foreign languages would do well to make strategic use of such materials and to make available more realistic materials. The use of technology allows for the creation of more realistic settings for language study.

In light of the widespread adoption and enabling power of immersive technologies and the potential applications of TELL, it is imperative that the literature be continuously investigated to identify the types and tendencies of recent studies in order to understand current practises and guide future research in the field with two research questions as follow:

RQ1: What are the trends and practices of TELL in language teaching and learning?

RQ2: What are the research methodologies employed in TELL studies?

Hence this study examines TELL from a variety of perspectives, including the distribution of research themes, the range of devices, and the methodological elements of the TELL studies, and include thorough summaries and annotated references on the issue. It gives a more all-encompassing picture of TELL by additionally carefully analysing the variety of research subjects, the purpose, and the methodological elements of TELL investigations.

3. Methodology

Methodologically, this study follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist, which consists of four steps (described in Figure 1): identification; screening; eligibility; and included. PRISMA's comprehensiveness and flexibility have made it a popular tool among researchers. As a result, the following describes the purpose of this research and how the systematic review will be conducted.

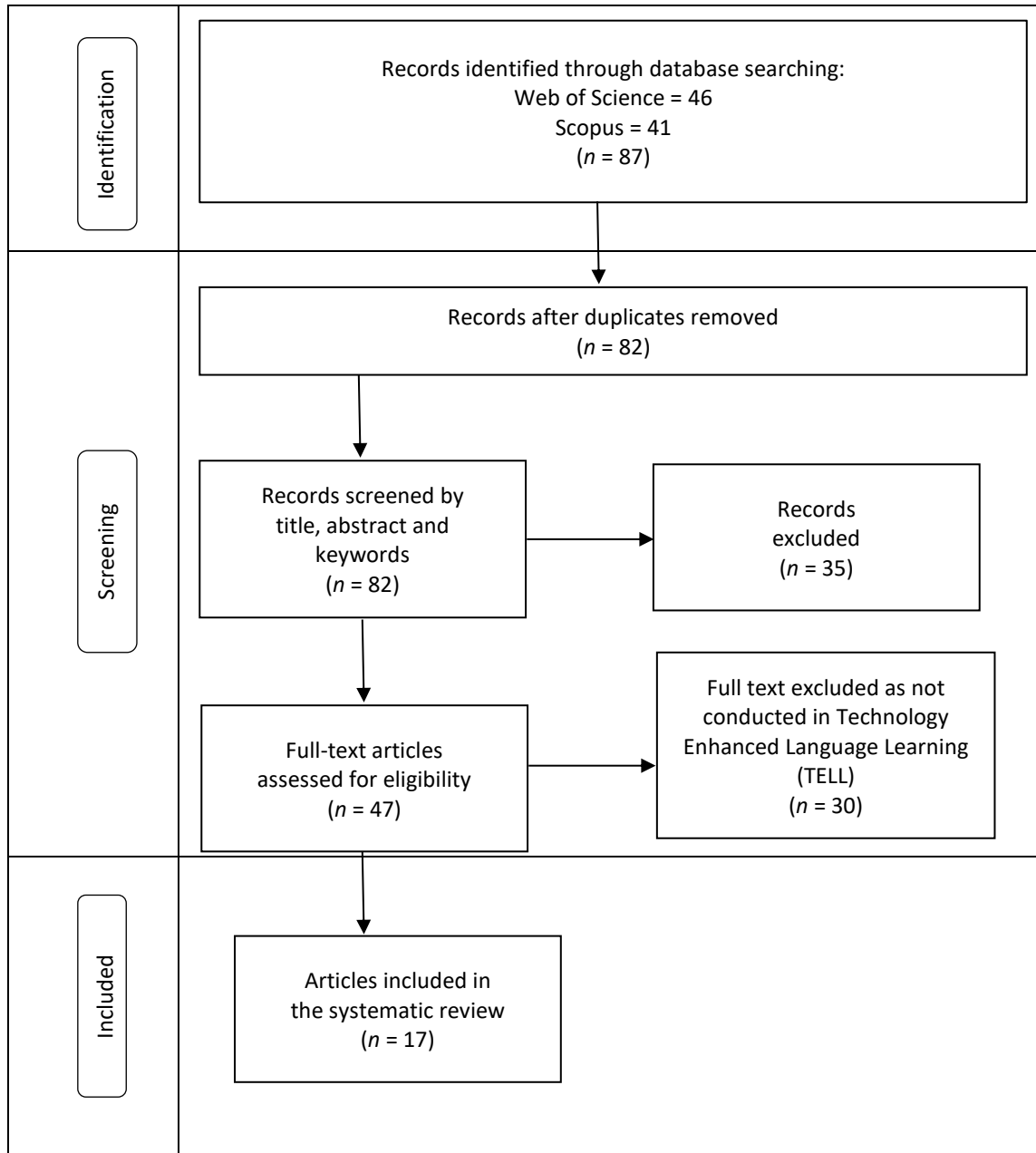


Figure 1: The PRISMA Systematic Review (Page et al., 2021).

3.1 Identification

The PRISMA guidelines outline the Identification procedure that must be followed as the first stage of any systematic review. For the purposes of this research, two databases—Web of Science (WoS) and Scopus—were selected. The review's primary phrases were developed with care to accurately capture the concepts that were to be examined. Several terms associated with TELL (Technology Enhanced Language Learning) were included. The search strings that were utilised in this research are shown in Table 1.

Table 1: Search String Used in This Study

Database	Search String
Web of Science (WoS)	TS= (("technology") AND ("enhanced") AND ("language learn*" OR "language teach*" OR "teaching language*" OR "language teaching and learning" OR "language pedagogy" OR "language teaching and learning"))
Scopus	TITLE-ABS-KEY (("technology") AND ("enhanced") AND ("language learn*" OR "language teach*" OR "teaching language*" OR "language teaching and learning" OR "language pedagogy" OR "language teaching and learning"))

*: Search String.

3.2 Screening

After articles are identified, they are screened, with the first step being the elimination of duplicates found in more than one database. After removing 5 duplicate articles from the initial screening, 82 articles remained. The titles, abstracts, and keywords of these 82 papers were examined for their relevance to the topic of "Technology-Enhanced Language Learning" (TELL). The screening approach resulted in the elimination of 35 papers that were deemed insignificant to the objectives of the study. Table 2 displays the results of the inclusion/exclusion screening applied to the remaining 47 publications.

Table 2: Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Studies conducted between 2020 and 2022	Studies conducted before 2020
Articles from journals	Conference proceedings, review articles, book
The text was written in English	Text not written in English
Related to TELL	Not related to TELL

Inclusion in this systematic review was contingent upon the evaluation of 17 publications, which were initially screened for eligibility using predetermined inclusion and exclusion criteria. We did review, but we did not include book chapters or conference proceedings because they are not quite as complete (González-Albo and Bordons, 2011).

3.3 Included

This review of the literature centred on TELL. The included research studies are listed in Table 3. Seven articles were selected from WoS and ten from Scopus using the data in the table above. The databases were selected because of the excellent quality of the educational content they include. Each investigation zeroed emphasis on a certain facet of the TELL environment. The majority of the investigations were undertaken in academic settings, with just five studies focused on students in the classroom, and only one examined parental influence on their children's English proficiency.

Table 3: Summary of the Selected Studies

Study	Database	Study	Database
Bin-Hady and Al-Tamimi (2021)	WoS, Scopus	Marden and Herrington (2022)	Scopus
Jung (2021)	WoS, Scopus	Duong, Tran and Nguyen (2021)	Scopus
Lawrence et al. (2020)	WoS, Scopus	Poonpon (2021)	Scopus
Van der Merwe (2020)	WoS, Scopus	Kurt (2020)	Scopus
Faramarzi, Tabrizi and Chalak (2021)	WoS	Wang and Hsu (2020)	Scopus
Choi, Kang and Sheo (2020)	WoS	Halim, Hashim and Yunus (2020)	Scopus
Dalte (2021)	WoS	Syukur Saud et al. (2020)	Scopus
Park (2022)	Scopus	Pokrovskaya et al. (2020)	Scopus

Study	Database	Study	Database
Mohammed (2022)	Scopus		

3.4 Data Analysis Procedure

All chosen articles were transferred to Mendeley, a citation manager. The following research problems were addressed using thematic analyses.

4. Findings and Discussion

4.1 RQ1: What are the Trends and Practices of TELL in Language Teaching and Learning?

The increasing number of articles between 2020-2022 confirms that interest in this area has been growing over the past three years especially during COVID-19 pandemic. The trends and practices of TELL in language teaching and learning were divided into six codes pertinent to RQ 1. The codes are: 1) aim 2) methodology 3) sample 4) country and 5) outcomes as shown in Table 4.

Table 4: Trends of TELL in Language Teaching and Learning

Study	Aim	Methodology	Sample	Country	Outcomes
Bin-Hady and Al-Tamimi (2021)	To explore the use of technology-based strategies develop their English as a foreign language skill in informal learning settings.	Mixed Method	Undergraduate EFL students.	Yemen	The approaches, according to the students, improved their vocabulary over grammar and pronunciation while also assisting them in the development of their speaking, listening, and reading abilities.
Jung (2021)	To explore the perceptions of post-secondary English as a Foreign Language (EFL) students on how their collaborative experiences of creating video projects influence their motivation to learn English.	Qualitative	Freshman student enrolled in a task-based EFL course.	South Korea	New knowledge about how technology-enhanced learning methods improve learner motivation in post-secondary EFL students.
Lawrence et al. (2020)	To discuss government-funded research documenting the largely undefined use of technologies in post-secondary North American English for Academic Purposes (EAP) programmes.	Mixed Method	EAP teachers and administrators.	Canada and United States	Integration of technology into EAP programmes requires a strong foundation in theory-informed technopedagogy.
Van der Merwe (2020)	To gather reflective feedback from an online dictionary project undertaken in a faculty of education at a university in the Western Cape.	Qualitative	Afrikaans intermediate phase students.	South Africa	The students' ability to expand their subject vocabulary in their native language improved as a result of their collaborative efforts and the usage of technology.

Study	Aim	Methodology	Sample	Country	Outcomes
Faramarzi, Tabrizi and Chalak (2021)	To investigate the major potentials and challenges of vodcasting technology in improving major language skills from EFL learners' perspectives.	Qualitative	Graduate students of Translation Studies.	Iran	Vodcasting helped people become more open-minded about other cultures and bolstered the communication quality of their conversations.
Choi, Kang and Sheo (2020)	To examine the effect of parent-child interactions and digital pen use in learning English.	Quantitative	Mothers of three-to-five year old preschool Children.	South Korea	Young children's interest in learning English was sparked when they were introduced to digital pens and encouraged to participate in regular conversations with their parents while reading English picture books.
Dalte (2021)	To present a SWOT analysis of the use of Edmodo and some other applications for the teaching and learning foreign languages for schools.	Quantitative	First grade students major in Teaching Chinese as a second language.	Ukraine	This paradigm places the learner at the centre of the classroom, allowing teachers to support an unlimited number of students while reducing the time and money spent on classroom administration.
Park (2022)	To investigate how TELL affected pre-service teachers' perceived competencies in teacher education.	Quantitative	Pre-service teachers at a medium-sized university.	Korea	Pre-service teachers benefited greatly from TELL training.
Mohammed (2022)	To present a fully online course model for teaching speaking and listening skills for students learning Arabic as a foreign language.	Quantitative	Arabic as a foreign language student in South Africa.	Africa	The methodology and framework used in this study can be adapted to a variety of settings where language is being taught.
Marden and Herrington (2022)	To examine the nature and extent of students' contributions to computer mediated communication tools provided in an online Italian as a foreign language learning environment.	Quantitative	Intermediate and advanced level students of Italian language course at.	Australia	Two distinct versions of the digital classroom have been developed, there was a significant improvement in how students used various discussion boards.
Duong, Tran and Nguyen (2021)	To unravel the employment of TELL tool based English vocabulary learning strategies (VLS)	Mixed Method	First year and second year non-English majored	Vietnam	Participants made extensive use of the English VLS based on the TELL tool.

Study	Aim	Methodology	Sample	Country	Outcomes
	among non-English majored students.		students at Ho Chi Minh City University of Technology .		
Poonpon (2021)	To explore how self-generated online projects were integrated into an English language teaching (ELT) at a Thai university and their impact on pre-service teachers' experience during COVID-19.	Qualitative	Pre-service English language teachers who took the linguistics and language teaching course.	Thailand	The future educators of English language found that participating in online projects boosted their confidence, motivation, problem-solving abilities, and teamwork skills.
Kurt (2020)	To investigate whether the completion of technology-mediated tasks would improve young EFL learners' achievement in listening, reading and writing tests.	Quantitative	The students in Grade 4 at a private primary school are split evenly between two classrooms.	Turkey	Students in the experimental group who participated in technology-mediated tasks reported higher levels of confidence in their ability to use technology and a more favourable outlook on the medium.
Wang and Hsu (2020)	To investigate students' perceptions of using mobile-assisted language learning to learn business English.	Quantitative	Undergraduate and graduate students majoring in engineering , electrical engineering and computer science.	Taiwan	The students were enthusiastic about using the programme to improve their business English skills.
Halim, Hashim and Yunus (2020)	To examine pupils' motivation and perceptions of ESL lessons through online quiz games.	Quantitative	Pupils from a primary school.	Malaysia	The incorporation of online quiz-games into English classes was seen favourably by these students, who reported feeling more motivated and having more optimistic attitudes.
Syukur Saud et al. (2020)	To explore students' perceptions of strategies, impact, and challenges using online resources for foreign language learning.	Qualitative	Students from foreign language department in one Indonesian	Indonesia	In addition to improving their material and language knowledge, students also gained valuable experience with modern technological tools.

Study	Aim	Methodology	Sample	Country	Outcomes
			public university.		
Pokrovska et al. (2020)	To enhance the educational process and training skills of independent long term professional upgrade of students through MS Office 365 cloud services.	Quantitative	2nd and 3rd year undergraduate students from Vadym Hetman Kyiv National Economic University and the Kyiv National University of Trade and Economics.	Ukraine	To meet the challenges of today's classrooms, schools must invest in their students' ability to think logically (critically), creatively approach problems, and retain information.

4.2 RQ2: What Methodologies are Employed in TELL Studies?

There were three distinct types of research procedures employed across all 17 papers that were included in the systematic review. Most studies of language-teaching and learning trends and practises employed a quantitative research strategy. Only three studies employed a mixed research design (see Table 4). Nine quantitative investigations were conducted, with two using a quasi-experimental design and seven using a survey approach with questionnaires. The findings of this review corroborate the claims of Mohammed (2022), Choi, Kang and Sheo (2020), and Park (2022) that quantitative research methods are increasingly common among educational academics.

One possible explanation for this situation is that academics would rather use quantitative methods to investigate the rising popularity of TELL as a tool for facilitating language instruction. According to Creswell (2012) and Babbie (2020), the application of well-established computational approaches that enable research generalisations makes statistical analysis more dependable, objective, and accurate than traditional methods of data collection and interpretation. Five out of the total of seventeen studies (50%), used a qualitative approach to data collection. Case studies were employed in the research by Jung (2021), Van der Merwe (2020), and Faramarzi, Tabrizi and Chalak (2021) to investigate how TELL is being implemented in language classrooms and how it is being perceived, its impact, and the difficulties that arise from doing so.

Lack of qualitative research in TELL suggests that scholars are more interested in developing a surface-level understanding of the TELL phenomena than doing in-depth studies on the topic. The results of qualitative research are often criticised for being unreliable because of its small sample sizes, anecdotal character, lack of rigour, reliability and validity difficulties, hard to generalise, uncontrolled bias, and subjectivities (Anderson, 2010; Luo, 2011; Lenger, 2019).

Analysing qualitative data may be very difficult, iterative, complex, confusing, and time-consuming, despite the fact that it provides well-founded, detailed, and long narrations of individuals' experiences and reasonings in relation to the issues at hand (Hilal and Alabri, 2013; Miles, Huberman and Saldaña, 2018). Even with well-established qualitative data analysis software, researchers often struggle to elucidate the implicit meanings that people associate with their actions and responses to a phenomenon. This is due to the researcher's own presumptions, opinions, and personal opinions, which can be a bias to the findings (Hilal and Alabri, 2013; Erlingsson and Brysiewicz, 2017). Many researchers still shy away from qualitative research due to the external criticism and analytical difficulty associated with it, despite the fact that more qualitative research is needed in the TELL field due to the diversity, quality, and authority it can aid in the development of a more nuanced understanding of educational problems.

Of the seventeen studies completed on TELL in language education between 2020 and 2022, only three used a mixed-method technique. Three separate researchers combined questionnaires with open-ended questions or semi-structured interviews. The relevance of exploring and understanding TELL activities in language teaching

and learning through a range of lenses is highlighted by the use of a mixed-method approach. The systematic review's findings corroborate the opinions of other researchers, who have been saying for years that mixed-method research designs are becoming more and more commonplace in the social sciences (Seyfried and Reith, 2019; Timans, Wouters and Heilbron, 2019).

By combining quantitative and qualitative approaches, researchers in the area of education hope to get a more complete understanding of their research questions and the phenomena they seek to examine than each approach could on its own (Creswell and Clark, 2017; Molina-Azorin, 2016). In addition, the mixed-method approach is laudable because it allows researchers to gain triangulated data that improves the validity and completeness of evidence supporting TELL methods in language teaching and learning (Creswell and Clark, 2017; Gibson, 2017).

5. Conclusion

This study's systematic literature review, which looked at seventeen publications published between 2020 and January 2022, provided an answer to the study's overall research question about the state of TELL research trends and practises in language education. This review's conclusions have synthesised the state of the art in TELL research on language instruction with respect to study purpose, technique, sample size, country of origin, and findings. The analysis found that research on TELL and its use in language teaching and learning is still in its preliminary phases, despite the enormous expansion and promise of technology. In order to deploy TELL across all educational levels in a way that satisfies the demands of Education 4.0, extensive research is needed to fill the gaps shown by the current review.

This study, like many studies, has its flaws, but those flaws all serve as excellent jumping-off points for more research. To begin with, the scope of this review is bounded by the journals that were consulted. The rising volume of articles in TELL makes it harder than ever to do a thorough and exhaustive search. This is why this study developed clear criteria for choosing which journals to include in our analysis. Due to their greater influence in the area, the journals included in WoS and Scopus were chosen as the sole sources for this analysis, despite the wide quality gap between them. Recent TELL studies have shown the advantages of publishing in high-impact journals, but this preference recognises the drawbacks of ignoring equally outstanding contributions published in other high-impact journals. Therefore, future research may want to examine into TELL studies in other publications, conference proceedings, project reports, and academic dissertations to better understand its development and current condition. The study is limited in its breadth because of the precision of the keywords employed, the nature of the questions posed, and the time span covered by the articles. Although the focus on 2020–2022, and diverse research questions, did ensure that the review covered almost the entire corpus of recent research in detail, an examination of articles produced within a larger date range, or of articles with different areas of research focus, would reflect even wider trends of development and changes in TELL studies over time. It is possible that future studies will give light on whether or not TELL is mostly employed as a stand-alone modality or as part of well-established courses or programmes based on great pedagogy, both of which would provide valuable insights.

References

- Anderson, C. 2010. Presenting and evaluating qualitative research. *American Journal of Pharmaceutical Education*, 74(8), pp. 1-7. <https://doi.org/10.5688/aj7408141>
- Asllani, H., and Paçarizi, R. 2021. Enhancing second language incidental vocabulary learning through technology. *Journal of Educational and Social Research*, 11(4), pp. 107-117. <https://doi.org/10.36941/jesr-2021-0081>
- Babbie E. R. 2020. *The Practice of Social Research*. London: Cengage Learning.
- Bin-Hady, W. R. A., and Al-Tamimi, N. O. M. 2021. The use of technology in informal English language learning: evidence from Yemeni undergraduate students. *Learning and Teaching in Higher Education: Gulf Perspectives*, 17(2), pp. 107-120. <https://doi.org/10.1108/LTHE-09-2020-0037>
- Carr, N. T., Crocco, K., Eyring, J. L., and Gallego, J. C. 2011. Perceived benefits of technology enhanced language learning in beginning language classes. *International Association for Language Learning Technology Journal of Language Learning Technologies*, 41(1), pp. 1–32. <https://doi.org/10.17161/iallt.v41i1.8480>
- Chirimbu, S., and Tafazoli, D. 2013. Technology and media: Applications in language classrooms (TEFL, TESL and TESOL). *Professional Communication and Translation Studies*, [online] 6(1-2), pp. 187-194. Available at: <https://sc.upt.ro/images/cwattachments/118_663e3a7e308421b3afbe2df2a7b80ff6.pdf> [Accessed 7 November 2022].
- Choi, N., Kang, S., and Sheo, J. 2020. Children's interest in learning English through picture books in an EFL context: The effects of parent-child interaction and digital pen use. *Education Sciences*, 10(2), pp. 40. <https://doi.org/10.3390/educsci10020040>

- Creswell, J. W. 2012. *Education research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed). Columbus, Ohio: Pearson Education.
- Creswell, J. W., and Clark, V. L. P. 2017. *Designing and conducting mixed methods research*. New York: Sage publications.
- Dalte, O. 2021. The impact of technology-enhanced learning environment on teaching Chinese as a second language. *Information Technologies and Learning Tools*, 82(2), pp. 126-138. <https://doi.org/10.33407/itlt.v82i2.3497>
- Duong, T. M., Tran, T. Q., and Nguyen, T. T. P. 2021. Non-English majored students' use of English vocabulary learning strategies with technology-enhanced language learning tools. *Asian Journal of University Education*, 17(4), pp. 455-463. <https://doi.org/10.24191/ajue.v17i4.16252>
- Erlingsson, C. and Brysiewicz, P. 2017. A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, 7(3), pp.93-99. <https://doi.org/10.1016/j.afjem.2017.08.001>
- Faramarzi, S., Tabrizi, H. H., and Chalak, A. 2021. Vodcasting tasks in online L2 classes: investigating the potentials and challenges in distance language learning. *International Journal of Technology Enhanced Learning*, 13(1), pp. 24-43. <https://doi.org/10.1504/ijtel.2021.111589>
- Fuente, J. A. D. 2021. Facebook messenger as an educational platform to scaffold deaf students' conceptual understanding in environmental science subject: A single group quasi-experimental study. *International Journal of Education*, 14(1), pp. 19-29. <https://doi.org/10.17509/ije.v14i1.31386>
- Fung, C. Y., Su, S. I., Perry, E. J., and Garcia, M. B. 2022. Development of a socioeconomic inclusive assessment framework for online learning in higher education. In: *Socioeconomic Inclusion During an Era of Online Education*. Pennsylvania: IGI Global. pp. 23-46. <http://dx.doi.org/10.4018/978-1-6684-4364-4.ch002>
- Ghanizadeh, A., Razavi, A., and Jahedizadeh, S. 2015. Technology-enhanced language learning (TELL): A review of resources and upshots. *International Letters of Chemistry, Physics and Astronomy*, 54, pp. 73-87. <https://doi.org/10.18052/www.scipress.com/ILCPA.54.73>
- Ghory, S., and Ghafory, H. 2021. The impact of modern technology in the teaching and learning process. *International Journal of Innovative Research and Scientific Studies*, 4(3), pp. 168-173. <https://doi.org/10.53894/ijirss.v4i3.73>
- Gibson, C. B. 2017. Elaboration, generalisation, triangulation, and interpretation: On enhancing the value of mixed method research. *Organisational Research Methods*, 20(2), pp. 193-223. <https://doi.org/10.1177/1094428116639133>
- Golshan, N., and Tafazoli, D. 2014. Technology-enhanced language learning tools in Iranian EFL context: Frequencies, attitudes and challenges. *Procedia - Social and Behavioral Science*, 136, pp. 114-118. <https://doi.org/10.1016/j.sbspro.2014.05.299>
- González-Albo, B., and Bordons, M. 2011. Articles vs. proceedings papers: Do they differ in research relevance and impact? A case study in the library and information science field. *Journal of Informetrics*, 5(3), pp. 369-381. <https://doi.org/10.1016/j.joi.2011.01.011>
- Halim, M. S. A. A., Hashim, H., and Yunus, M. M. 2020. Pupils' motivation and perceptions on ESL lessons through online quiz-games. *Journal of Education and E-Learning Research*, 7(3), pp. 229-234. <https://doi.org/10.20448/journal.509.2020.73.229.234>
- Hermanto, Y. B., and Srimulyani, V. A. 2021. The challenges of online learning during the covid-19 pandemic. *Jurnal Pendidikan dan Pengajaran*, 54(1), pp. 46-57. <https://doi.org/10.23887/jpp.v54i1.29703>
- Hilal, A. H., and Alabri, S. S. 2013. Using NVivo for data analysis in qualitative research. *International Interdisciplinary Journal of Education*, 2(2), pp. 181-186. <http://dx.doi.org/10.13140/RG.2.2.20913.10082>
- Hubbard, P. 2013. Making a case for learner training in technology enhanced language learning environment. *Computer-Assisted Language Instruction Consortium Journal*, 30(2), pp. 163-178. <https://doi.org/10.11139/cj.30.2.163-178>
- Jung, C. D. 2021. Perceptions of collaborative video projects in the language classroom: A qualitative case study. *International Journal of Instruction*, 14(4), pp. 301-320. <https://doi.org/10.29333/iji.2021.14418a>
- Kipper, L. M., Iepsen, S., Dal Forno, A. J., Frozza, R., Furstenu, L., Agnes, J., and Cossul, D. 2021. Scientific mapping to identify competencies required by industry 4.0. *Technology in Society*, 64, pp. 1-9. <https://doi.org/10.1016/j.techsoc.2020.101454>
- Kranthi, K. 2017. Technology enhanced language learning (TELL). *International Journal of Business and Management* *Invention*, [online] 6(2), pp. 30-33. Available at: <[https://www.ijbmi.org/papers/Vol\(6\)2/version-4/E0602043033.pdf](https://www.ijbmi.org/papers/Vol(6)2/version-4/E0602043033.pdf)> [Accessed 7 November 2022].
- Kulikowski, K., Przytuła, S., and Sułkowski, Ł. 2022. E-learning? Never again! On the unintended consequences of COVID-19 forced e-learning on academic teacher motivational job characteristics. *Higher Education Quarterly*, 76(1), pp. 174-189. <https://doi.org/10.1111/hequ.12314>
- Kurt, G. 2021. Technology-mediated tasks in the young learners' EFL classroom. *Elementary Education Online*, 20(1). <https://doi.org/10.17051/ilkonline.2021.01.031>
- Lawrence, G., Ahmed, F., Cole, C., and Johnston, K. P. 2020. Not more technology but more effective technology: Examining the state of technology integration in EAP programmes. *Regional Language Centre Journal*, 51(1), pp. 101-116. <https://doi.org/10.1177/0033688220907199>
- Lenger, A. 2019. The rejection of qualitative research methods in economics. *Journal of Economic Issues*, 53(4), pp. 946-965. <https://doi.org/10.1080/00213624.2019.1657748>
- Luo, H. 2011. Qualitative research on educational technology: Philosophies, methods and challenges. *International Journal of Education*, 3(2), pp. 1-16. <https://doi.org/10.5296/ije.v3i2.857>

- Marden, M. P., and Herrington, J. 2022. Asynchronous text-based communication in online communities of foreign language learners: Design principles for practice. *Australasian Journal of Educational Technology*, 38(2), pp. 83-97. <https://doi.org/10.14742/ajet.7370>
- Miles, M. B., Huberman, A. M., and Saldaña, J. 2018. *Qualitative data analysis: A methods sourcebook*. New York: Sage Publications.
- Mohammed, T. 2022. Designing an Arabic speaking and listening skills e-course: Resources, activities and students' perceptions. *Electronic Journal of e-Learning*, 20(1), pp. 53-68. <https://doi.org/10.34190/ejel.20.1.2177>
- Molina-Azorin, J. 2016. Mixed methods research: An opportunity to improve our studies and our research skills. *European Journal of Management and Business Economics*, 25(2), pp. 37-38. <https://doi.org/10.1016/j.redeen.2016.05.001>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., and Moher, D. 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Systematic Reviews*, 10(1), pp. 1-11. <https://doi.org/10.1186/s13643-021-01626-4>
- Park, E. 2022. An examination on EFL preservice teachers' development of core competencies through technology-enhanced language learning. *Journal of Language Teaching and Research*, 13(4), pp. 697-706. <https://doi.org/10.17507/jltr.1304.02>
- Patel, D. S. 2014. Significance of technology enhanced language learning (TELL) in language classes. *Journal of Technology for English Language Teaching*, [online] 4(2) Available at: <https://sites.google.com/site/journaloftechnologyforelt/archive/vol-4-no-2-1/2> [Accessed 7 November 2022].
- Penado Abilleira, M., Rodicio García, M. L., Ríos-de Deus, M. P. and Mosquera González, M. J. 2021. Technostress in Spanish university teachers during the COVID-19 Pandemic. *Frontiers in Psychology*, 12, pp. 1-11. <https://doi.org/10.3389/fpsyg.2021.617650>
- Pokrovskaya, I. L., Kolodko, T. M., Aliyeva, Z. K., Tymoshchuk, I. V., and Vakariuk, R. V. 2020. Integration of cloud technologies in teaching foreign languages in higher education institutions. *International Journal of Learning, Teaching and Educational Research*, 19(2), pp. 46-59. <https://doi.org/10.26803/ijlter.19.2.4>
- Poonpon, K. 2021. Integrating self-generated online projects in an ELT class at a Thai university during the COVID-19 pandemic. *Asia Pacific Journal of Educators and Education*, 36(2), pp. 183-203. <https://doi.org/10.21315/apjee2021.36.2.10>
- Sandoval-Cruz, R. I., Navarro Rangel, Y., González Calleros, J. M., and Perales-Escudero, M. D. 2022. Pre-service EFL teachers' conceptions of learning about SLA through online discussion forums and WhatsApp in Blended Learning. *Regional Language Centre Journal*, 53(1), pp. 165-179. <https://doi.org/10.1177/0033688220917221>
- Seyfried, M., and Reith, F. 2019. Mixed methods for research into higher education: Solving the problem of institutionalized introspection? In: *Theory and Method in Higher Education Research*, 5, pp. 111-127. Bingley: Emerald Publishing Limited. <http://dx.doi.org/10.1108/S2056-375220190000005008>
- Shomirzayev, S. 2021. National followers in the students use of educational technologies instruction of interests. *International Journal of Linguistics, Literature and Culture*, 7(3), pp. 152-157. <https://dx.doi.org/10.21744/ijllc.v7n3.1508>
- Sumter, D., de Koning, J., Bakker, C., and Balkenende, R. 2021. Key competencies for design in a circular economy: Exploring gaps in design knowledge and skills for a circular economy. *Sustainability*, 13(2), pp. 776. <https://doi.org/10.3390/su13020776>
- Syukur Saud, Muhammad Basri, Ramly Ramly, Amirullah Abduh and Andi Anto Patak. 2020. Using online resources technology for foreign language learning: strategies, impact, and challenges. *International Journal on Advanced Science, Engineering and Information Technology*, 10(4), pp. 1504-1511. <http://dx.doi.org/10.18517/ijaseit.10.4.11838>
- Timans, R., Wouters, P., and Heilbron, J. 2019. Mixed methods research: what it is and what it could be. *Theory and Society*, 48(2), pp. 193-216. <https://doi.org/10.1007/s11186-019-09345-5>
- Tseng, S. (2019). Technology and learning English. *International Journal of Liberal Arts and Social Science*, [online] 7(1), pp. 14-29. Available at: [https://www.ijbmi.org/papers/Vol\(6\)2/version-4/E0602043033.pdf](https://www.ijbmi.org/papers/Vol(6)2/version-4/E0602043033.pdf) [Accessed 7 November 2022].
- Van der Merwe, M. F. 2020. Scaffolding for content knowledge of home language learning by collaborative online dictionaries. *Per Linguam: A Journal of Language Learning*, 36(1), pp. 1-14. <https://doi.org/10.5785/36-1-893>
- Wang, Y. C., and Hsu, L. 2020. Shall we go to the MALL?—Students' perceptions of a business English learning app. *International Journal of Information and Education Technology*, 10(2), pp. 110-116. <https://doi.org/10.18178/ijiet.2020.10.2.1348>
- Yang, S. C., and Chen, Y. J. 2007. Technology-enhanced language learning: A case study. *Computers in Human Behavior*, 23(1), pp. 860-879. <https://doi.org/10.1016/j.chb.2006.02.015>
- Yeşilel, D. B. A. 2016. Technology-enhanced language learning for digital natives. *Participatory Educational Research*, [online] Special Issue 2016-IV, pp. 97-111. Available at: http://www.perjournal.com/archieve/spi_16_4/per_16_spi_4_14.pdf [Accessed 7 November 2022].