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Research Paper

Digital Ecologies of Learning and Pedagogical Practices in Secondary English Teaching: A Systematic Review

Jeisson Celis M.¹

Ph.D. Candidate, Department of Education Sciences, Faculty of Education, University of Technology and Education

Luis F. Cardona

Associate Professor, Department of Education Sciences, Faculty of Education, University of Technology and Education

Abstract

The continuous transformation of learning environments is the result of the impact of digital expansion within school educational settings. In this sense, digital ecologies have significantly reconfigured English as a foreign language teaching and learning, challenging EFL teachers to develop a deeper understanding of language didactics in the post-digital era. This leads to a critical and reflective adaptation of pedagogical practice using emerging technologies to promote bilingualism. Consequently, this systematic review, structured according to the PRISMA declaration, aims to characterize the scientific literature on new digital learning ecologies in secondary school contexts, where ongoing innovation in the teaching of this area of knowledge has occurred. The results demonstrate the impact of bilingual training scenarios, in which digital interaction dynamics have strengthened teachers' communicative and technological skills, leading to a redefinition of classroom practices toward more motivating environments for students. Increased trust and security strengthen language learning and open the door to building multidirectional physical and digital communicative environments.

¹ Corresponding author: celis.jeissons@uted.us

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1. Introduction

In the current digital context, education is continually undergoing changes that lead to the reconfiguration of pedagogical practices from a technological perspective. The literature highlights the relevance of reconfiguring foreign language teaching and learning processes at the school level, demanding new pedagogical and didactic designs that start from the recognition of non-isolated learning environments and learning identities, both individual and collective (Luckin, 2008), in various forms of interaction at the microsystemic, mesosystemic, exosystemic, macrosystemic, and chronosystemic levels (Bronfenbrenner, 1994). Thus, the incorporation of various technological tools and the possibility of learning through connectivity constantly modify the teaching and learning dynamics of English as a Foreign Language (EFL), promoting more dynamic and active educational environments that redefine the roles and relationships of participants in the bilingual training process.

Consequently, EFL teaching presents new challenges in terms of training and professional updating in secondary and middle education, promoting the reconfiguration of the design and development of bilingual practices in the school environment, strengthening communication skills from the very needs of 21st-century society and the advances of the fourth industrial revolution (Meniado, 2023). This implies integrating innovative methodologies into communication practices and using emerging technologies in language teaching (Herrera Mosquera, 2017), enabling a proactive rethinking of how the curriculum, methodologies, resources, and academic products are transformed, considering the diversity of language use among students globally. In this regard, the study of digital ecologies is essential, as it enables us to understand how technological, pedagogical, communicative, and social dimensions interact in contemporary EFL learning environments. Therefore, this study contributes to the discussion of how digitally focused learning

systems can support the development of teachers' technological and communicative competencies while also promoting the transformation of pedagogical practices in bilingual education.

Although there is a significant digital transformation initiative in bilingual education pedagogical practice (Caviglia et al., 2024), a gap persists in traditional practices that promote memorization, incidental learning, and linear discourse structures. These practices still limit the implementation of technology in language classes, reducing it to a tool for translation, computer management, and visual projection, rather than using it as an active agent and contributor to functional communication environments (Chun et al., 2016). This situation represents a central problem for EFL teaching, since the theoretical discourse supporting the integration of technology does not always align with the pedagogical practices implemented in secondary education classrooms. This requires an unavoidable adjustment to constant technological change in order to strengthen and guarantee meaningful pedagogical practice (Alva Miguel et al., 2023; Msimango, 2025), not only in terms of communicative competence in two languages, but also in terms of digital skills, understanding of the cultural system, and adaptive social competence for a comprehensive and resilient education (Riyanda et al., 2025; Hernández-Serrano et al., 2025).

From this perspective, where emerging technologies have an *a priori* place and, as a result, are an indispensable part of current learning ecosystems, it is convenient to understand the latent tension between the reality of praxis and the scientific postulates that theoretically promote the implementation of technology as an indispensable component of training in English as a foreign language (Jiménez Becerra, 2020). Therefore, the purpose of this systematic review is to analyze current digitally focused learning systems in relation to the pedagogical practices of English language (EFL) teachers in secondary and middle education, thereby generating a dialogue between the theoretical perspectives proposed to strengthen bilingualism and digital-focused teaching practices. Specifically, this study seeks to recognize the role of digital ecologies in developing teachers' competencies in both technological and communicative dimensions, as well as their contribution to the transformation of EFL pedagogical practices. This study is based on the following review questions, which guide its development:

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RQ1. What evidence exists on the role of digital ecologies in the development of pedagogical practices of English language (EFL) teachers?

RQ2. How is the transformation of the pedagogical practice of L2 teachers in secondary education perceived from digital environments?

RQ3. How are learning scenarios reconfigured through digital immersion?

2. Literature Review and Method

In educational research, the PRISMA statement is one of the most widely implemented research protocols (Ciaipponi, 2021; Sánchez-Serrano et al., 2022). These guidelines have allowed for the synthesis of evidence on the applicability of new pedagogical strategies and teaching models, published in various scientific articles. In the literature on digital learning ecologies, in particular, there has been an increase in studies related to technology and digital ecosystems. Therefore, this work will use the PRISMA guidelines as a model for the identification, analysis, and evaluation of data that will allow for the precise and objective management of aspects related to the dynamics of interaction between English language learning environments at the school level and emerging digital technologies (Costan et al., 2021; Page et al., 2021; Yang et al., 2025).

According to Monsalve Lorente & Aguasanta Regalado (2020), the rise and transformation of digital learning environments have motivated new forms of educational interaction, fostering greater interest in understanding digital learning ecosystems. In this context, the PRISMA guidelines facilitate a systematic review to determine the state of knowledge and establish priorities for future research in the field of digital learning ecologies and bilingualism, with respect to outcomes that have not yet been addressed (Page et al., 2021). This opens the possibility of expanding the field of knowledge and optimally verifying data resulting from recent research.

Therefore, this article focuses on the concept of digital learning ecologies. An initial search associates 1132 research products, as illustrated in the flowchart described in Figure 1. This approach comprises different methodological stages, including material selection, descriptive analysis, and thematic analysis (Page et al., 2021).

2.1 Procedure and data analysis

This systematic review study was developed during the second half of 2025 and was based on the metasynthesis approach, considered a bibliographic review strategy for the examination and interpretation of search results in specific sets (Maeda et al., 2022; Finfgeld, 2003). For the location and selection of sources, the bibliographic search focused on identifying articles, books, book chapters, and conference proceedings in the Scopus database. The use of this repository is justified by its complete academic coverage, high-quality content, citation indexing, advanced search functions, and global scientific representation. (Botelho et al., 2025).

Table 1 illustrates the search strategy and key concepts used in the systematic review. Regarding the term digital learning ecologies, given that it is not yet a widely consolidated concept, the temporal delimitation of this study spans from 2020 to the first publications available in 2025. From this scope, the following key concepts were generated: “learning ecologies”, “teacher digital competence”, “pedagogical practice”, “English teachers” and “secondary education”. Based on these, search codes were proposed using Boolean operators such as AND, OR, and NOT.

Table 1
Design and application of search codes in Scopus

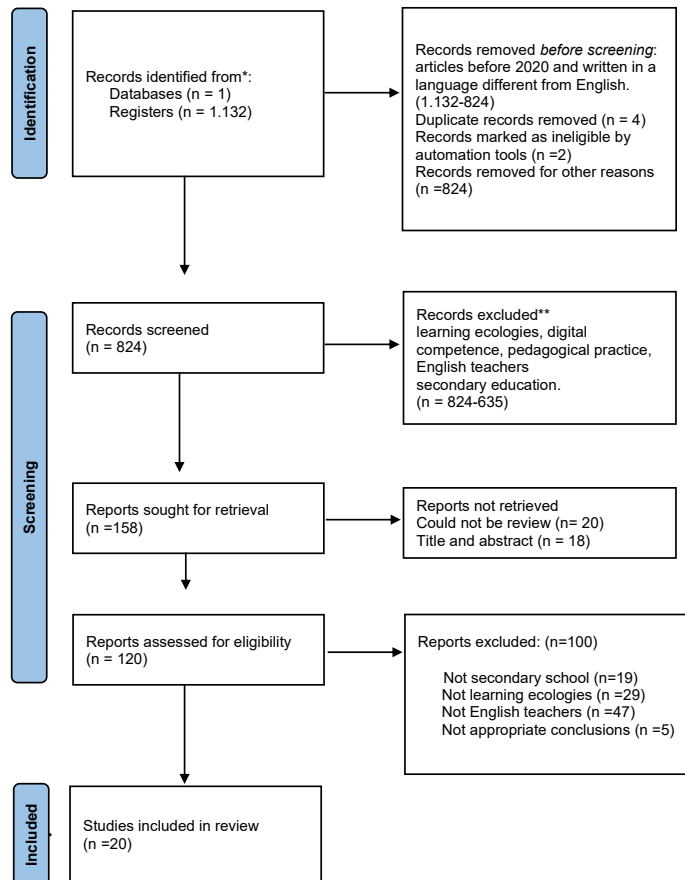
No	SEARCH CODES	RESULTS
1	<i>Application of key terms</i> (((“learning ecologies”) AND (“digital competence”) AND (“pedagogical practice”) AND (“English teachers”) OR (“teachers”)) AND (“secondary education”))	1.132
2	<i>Year filter application</i> (2020-2025)	824
3	<i>Exclusion term filter application</i> (((((((“learning ecologies”) AND (“digital competence”) AND (“pedagogical practice”) AND (“English teachers”) OR (“teachers”)) AND (“secondary education”)) AND NOT (“Engineering Education”) AND NOT (“Cluster Analysis”) (“Conceptual Framework”) (“Children”))))))	635

Note. Created by the authors

2.2 Selection, inclusion and exclusion criteria

The selection process followed the PRISMA guidelines, focusing on studies related to digital learning ecologies and EFL pedagogical practices. From an initial 158 records retrieved in Scopus, 38 were excluded after abstract screening. A full-text review led to the exclusion of 53 additional documents due to inconsistencies in population, design, or outcomes. The final dataset comprised 20 empirical studies, reflecting both the scarcity of research explicitly addressing this topic and the rigorous nature of the selection process.

Figure 1
PRISMA systematic review flowchart



Note. Adapted from “The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews,” by M. J. Page, J. E. McKenzie, P. M. Bossuyt, I. Boutron, T. C. Hoffmann, C. D. Mulrow, et al., 2021, *Revista Española de Cardiología*, 74(9), 790–799.
<https://doi.org/10.1016/j.recesp.2021.06.016>

2.3 Statistical and Comparative Analysis

The statistical analysis in this study was based on information manually collected in accordance with the PRISMA guidelines for systematic reviews. A data matrix was developed to integrate key variables that directly addressed the research questions. The variables systematized included the article title, journal of publication, quartile ranking, year of publication, authors' countries of affiliation, and the number of nations involved in academic collaboration. The data were then organized into frequency tables and visualized through different graphical resources to highlight relevant distributions, trends, and proportions.

3. Discussion

The studies reviewed and presented in the previous flowchart propose a descriptive, qualitative analytical framework that links the importance of understanding the digital learning ecologies of English as a Foreign Language (EFL) teachers as dynamic environments connecting pedagogical practice, digital competencies, and the strengthening of language teaching models from a functional and comprehensive perspective. Thus, this section seeks to answer the guiding review questions by comparing relevant aspects, including each study's purpose, methodological design, sample, research question, main results, and conclusions.

The studies focus on EFL pedagogical practice reconstructed using emerging digital technologies in secondary school educational environments. It highlights the trend towards the implementation of hybrid educational environments in spaces where teaching is usually formal and sometimes traditional, but which are rapidly opening up to enable powerful teaching scenarios in which challenges and tensions are present in the gaps of technological resources, digital illiteracy, and an increase in the use of information without regulation or educational ethics.

Among the studies included in this systematic review ($N = 20$), three specific approaches to similarity are evident, as illustrated in Figure 2. First, that of technology and digital environments, which show with 73.7% ($N=14$) that the majority are dimensioned in this perspective as their central purpose, exploring the EFL English learning experiences of secondary school students (Zhao et al., 2025) and proposing strategies that allow giving a valuable role

to digital tools in the development of communicative competences from bilingualism. This perspective also considers the concept of integral interaction (Hoerudin, 2025; Zhao et al., 2025) as a model that includes cognitive, affective, social, and technological dimensions in a holistic way in learning environments, seeking an understanding of how these individual and collective factors can be combined to improve L2 communication in a functional and meaningful way. (Yudintseva, 2024)

Secondly, the adoption of the ecological or learning systems perspective is another approach to similarity in the studies; 56.8% propose Bronfenbrenner's ecological systems theory as a complex interaction framework in which the concept of Digital Learning Ecology is developed (N = 11). Thus, the search for the identification of ecological factors that include bilingualism (Zhao et al., 2024) allows the generation of pedagogical strategies that consciously address the existing relationship between the roles of the actors in the learning process, physical and digital resources, social conditions, and environments mediated by school backgrounds and the challenges of the current context permeated by emerging technologies. (Lee & Jeon, 2024; Zadorozhnyy et al., 2025).

Finally, a third approach, identified in 42.1% of the studies (N = 8), focuses on teachers and their professional development, based on the pedagogical and technological skills necessary to teach English as a second language (ELS) (Taghizadeh & Ejtehadi, 2023). They consider the reflexive stance of the educator who continually works to implement digital technologies as tools for language development (Moorhouse & Kohnke, 2021). Figure 2 presents the main studies on the challenges, assessment gaps, and pedagogical perceptions of emerging technologies in learning ecologies.

Although these investigations are framed within guidelines on digital learning ecologies, they also reveal significant differences, particularly in the fragmentation of the conceptual approaches employed. The studies examine diverse emerging ecological factors, including motivation, specific pedagogical strategies in second language learning such as EMI, Translanguaging, VR, and TAP (Lu et al., 2025; Muñoz-Basols et al., 2023; Yudintseva, 2024), as well as the technological impact on willingness to communicate (WTC) in correlation with intrinsic motivation (Williyan et al., 2024). The main categories identified across the studies are: Learning ecologies, Digital competence, Pedagogical practice, English teachers, and

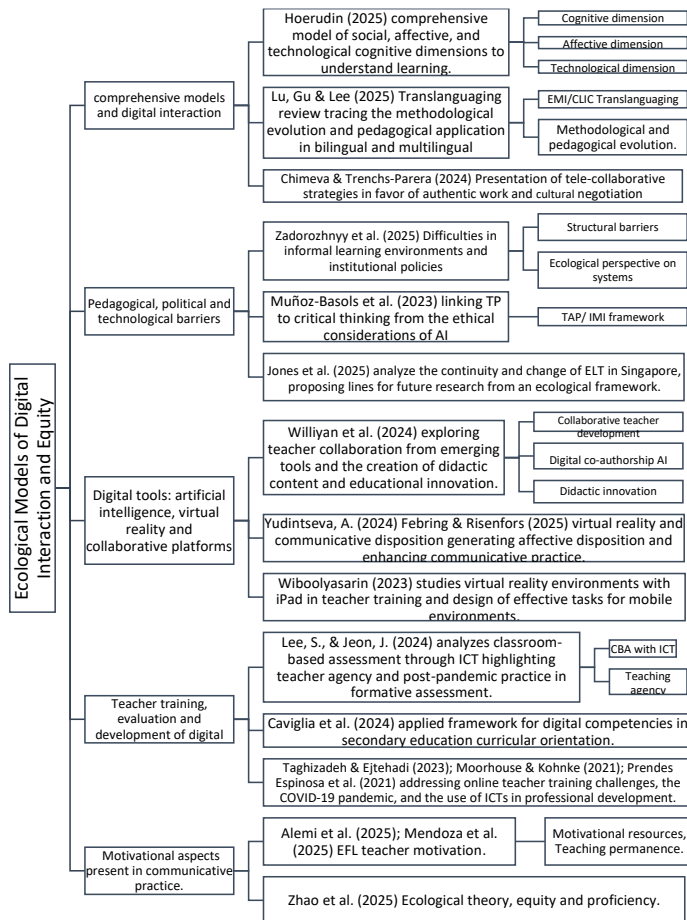
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Secondary education. Table 2 presents the frequency of the main categories identified in the reviewed studies.

Figure 2

Ecological models of digital interaction and equity: characteristics of the studies from specific categories



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Table 2

Frequency of Categories in the reviewed studies.

#	Authors (year)	Learning ecologies	Digital competence	Pedagogical practice	English teachers	Secondary education
1	Alemi, Khanlarzadeh, & Tajeddin (2025)	X		X	X	
2	Cecep Wahyu Hoerudin (2025)	X	X	X		
3	Zhao, P., Hassan, A., Burhanuddin, N. A. N., & Shi, L. (2025)	X	X	X	X	X
4	Zadorozhnyy, Winsy, & Lee (2025)	X	X	X	X	X
5	Febring L, Risenfors S (2025)		X	X	X	X
6	Lu, C., Gu, M. M., & Lee, J. C. K. (2025)	X	X	X	X	X
7	Jones, S. A. et al. (2025)	X	X	X	X	X
8	Mendoza, N. B. et al. (2025)	X		X	X	X
9	Yudintseva, A. (2024)		X	X	X	
10	Lee, S., & Jeon, J. (2024)	X	X	X	X	
11	Caviglia, F., Boie, M. A. K., Dalsgaard, C., & Pedersen, A. Y. (2024)		X	X	X	
12	Liu, G.L., Zhang, Y. & Zhang, R. (2024)	X	X	X		X
13	Williyan, A., Fitriati, S. W., Pratama, H., & Sakhiyya, Z. (2024)	X	X	X	X	
14	Zhao, P., Hassan, A. & Burhanuddin, N. A. N. (2024)	X	X	X	X	X
15	Chimeva, Y. & Trenchs-Parera, M. (2024)	X	X	X	X	X
16	Muñoz-Basols, Neville, Lafford, Godev (2023)	X	X	X		
17	Wiboolyasarini (2023)		X	X	X	X

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#	Authors (year)	Learning ecologies	Digital competence	Pedagogical practice	English teachers	Secondary education
18	Taghizadeh & Ejtehadi (2023)		X	X	X	
19	Moorhouse, B. L. & Kohnke, L. (2021)	X	X	X	X	X
20	Prendes Espinosa, M. P., Montiel Ruiz, F. J., & González Calatayud, V. (2021)	X	X	X	X	X

Note. Created by the authors

Among the reviewed authors, it is possible to establish a predominance of these 5 vector categories; below, their percentages of occurrence across the total number of studies are shown. Figure 3 shows that the transversal axis of the studies is pedagogical practice, with a total presence, suggesting that education depends on praxis for transformation in correlation with the didactic dimension in the school environment. Secondly, with a 90% recurrence rate, digital competences provide a development framework for educational environments. They are established as a starting point for reconfiguring current levels of interaction or ecological systems (Bronfenbrenner, 1994), specifically in EFL English classes, as evidenced in 89% of the studies. Now, although digital ecologies are not present in all the studies, representing only 75% of the sample, they internally presuppose the common thread of these, since from the current educational perspective, digital technology is part of the immediate environment of the subjects in the school environment, which directly affects the development of activities that seek to strengthen communicative competence in bilingualism, as well as appropriate various roles and relationships increasingly horizontal present in the learning environments of secondary school.

Another relevant aspect of this review is to consider the research question from which the studies originate, as illustrated in the bibliographic review table. The results show that these studies focus on three main aspects that align with the categories presented previously in Figure 3. Technological integration, learning ecologies and the teacher as a transforming agent of pedagogical practice within the framework of L2 classes (Lee & Jeon, 2024;

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Wiboolyasarín, 2023) suggest the search for conceptual elements to understand how digital environments are configured in educational settings, highlighting not only their importance, but also the existing tensions between traditional education systems and the new emerging digital learning ecologies from which teaching methods are proposed, recognizing in turn the teacher as an agent of change, motivator and responsible for collaboratively associating other external technological actors that dynamize the learning experience of a second language from a holistic and interdisciplinary approach that gives rise to the integration of pedagogy with educational technology (Liu et al., 2024). The questions are primarily descriptive and exploratory, aimed at scanning the literature; however, others are predictive (Mendoza et al., 2025; Zadorozhnyy et al., 2025), aiming to establish causal relationships and identify variables.

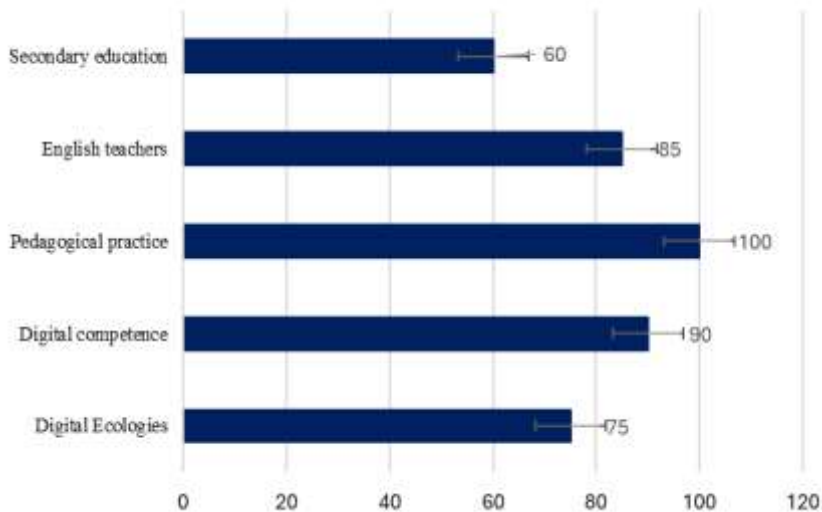
Likewise, the study designs lean toward qualitative research within the interpretive paradigm, as well as toward case studies and some proposals for mixed-methods research. (Alemlí et al., 2025; Febring & Risenfors, 2025; Prendes Espinosa et al., 2021; Zhao et al., 2025). In coherence with the complexity of the context, these methodological frameworks address the need to investigate the role of digital ecologies in the practice of teachers and are supported by highly rigorous research strategies, such as the triangulation of sources and the validation of implemented instruments, which provide credibility and depth to the findings. Ecological systems are conceived as an analytical framework (Luckin, 2008) that allows combining deductive analyses based on the categories defined in each study. Also, inductive analyses are used to understand emerging elements at the cognitive, affective, social, and technological levels.

Finally, from the categorical comparisons, the use of non-probability sampling is more frequent. It reveals a clear dependence on intentional convenience sampling (Alemlí et al., 2025), which compromises the representativeness of the data collection in the study population. It has also been observed previously that pedagogical practice in English as a foreign language is the most relevant category, as evidenced in Table 2. Consequently, for the analysis of the sample of studies, two perspectives or visions of this praxis are proposed: that of the teacher and that of the student. The size of these samples varies considerably; for example, while Lee & Jeon (2024) worked with 2 participants, Caviglia et al. (2024) involved 766

participants, resulting in a more representative analysis. However, this variability does not determine a generalization of the findings (Moorhouse & Kohnke, 2021).

Figure 3

Percentage of predominance in the emerging categories of the study



Note. Created by the authors

3.1 Results

Table 3 presents the bibliometric characterization of the analyzed articles using the PRISMA methodology. The set of reviewed articles originates from well-established journals in education and applied linguistics, displaying differentiated patterns of impact. In terms of accumulated citations within the sample, RELC Journal (81 citations) and ReCALL (68 citations across three articles; ~22.7 per article) stand out, followed by Hispania (46), Computer Assisted Language Learning (36), Teaching English with Technology (34), and the International Journal of Multilingualism (33). Other journals exhibit a moderate impact, such as System, with 18 citations across two articles (9 citations per article), Computers and Education: X Reality, with 14,

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Education Inquiry, with 7, and the Journal of Interactive Media in Education, with 5. In contrast, Cogent Education (3), Edelweiss Applied Science and Technology, and the International Journal of Learning, Teaching and Educational Research recorded no citations.

The publisher's analysis reveals an intense concentration of impact. Out of a total of 348 citations, more than 87% originated from just five publishing houses: SAGE Publications (81; 23.3%), Routledge (76; 21.8%), Cambridge University Press (68; 19.5%), Johns Hopkins University (46; 13.2%), and the University of Nicosia (34; 9.8%). The remaining citations were distributed among Elsevier (B.V. and Ltd, 32; 9.2% combined), Ubiquity Press (5), Taylor & Francis (3), Wiley (2), Universidad de Granada (1), and publishers that, while present, registered no citations in this sample (Learning Gate, IJLTER, Department of English Language Teaching – Tarbiat Modares University).

The quartile distribution highlights a clear concentration in Q1, with 15 out of 20 articles (75%) and 298 out of 348 citations ($\approx 85.6\%$), reflecting performance above expectations. Q3 accounts for three articles and 46 citations ($\approx 13.2\%$), while Q2 and Q4 are marginal, each with a single article and only 3 and 1 citations, respectively. Temporally, there is an ascending trend in Q1: in 2021, half of the articles were Q1 (alongside one Q4); in 2023, two-thirds were Q1; in 2024, six of seven publications were Q1 (with one Q2); and in 2025, six of eight were Q1 (alongside two Q3). This trend suggests an increasingly deliberate strategy for publishing in prestigious, high-visibility journals, as evidenced by the concentration of results in Q1.

Table 3

Bibliometric characterization of recent articles in English teaching (2021–2025)

Authors	Journal	Publication year	Publisher	Cited	Number of institutions involved	Quartile	H-Index
Alemi, M., Khanlarzadeh, N., & Tajeddin, Z.	System	2025	Department of English Language Teaching, Tarbiat Modares University, Tehran, Iran	0	3	Q1	115
Hoerudin, Cecep Wahyu	Edelweiss Applied	2025	Learning Gate	0	1	Q3	5

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Authors	Journal	Publication year	Publisher	Cited	Number of institutions involved	Quartile	H-Index
	Science and Technology						
Zhao, P., Hassan, A., Burhanuddin, N. A. N., & Shi, L.	International Journal of Learning, Teaching and Educational Research	2025	International Journal of Learning, Teaching and Educational Research	0	4	Q3	23
Zadorozhnyy, A., Winsy, L. W. Y., & Lee, J. S.	TESOL Quarterly	2025	John Wiley and Sons Inc	1	3	Q1	131
Febring, L., & Risenfors, S.	ReCALL	2025	Cambridge University Press	0	2	Q1	71
Lu, C., Gu, M. M., & Lee, J. C. K.	International Journal of Multilingualism	2025	Routledge	33	3	Q1	57
Jones, S. A., Loh, C. E., & Sabnani, R. L.	Language Teaching	2025	Cambridge University Press	0	3	Q1	87
Mendoza, N. B., Zadorozhnyy, A., & Dizon, J. I. W. T.	British Journal of Educational Psychology	2025	John Wiley and Sons Ltd	1	3	Q1	120
Yudintseva, A.	Computers and Education: X Reality	2024	Elsevier B.V.	14	1	Q1	11
Lee, S., & Jeon, J.	System	2024	Elsevier Ltd	18	2	Q1	115
Caviglia, F., Boie, M. A. K., Dalsgaard, C., & Pedersen, A. Y.	Education Inquiry	2024	Routledge	7	4	Q1	30
Liu, G. L., Zhang, Y., & Zhang, R.	ReCALL	2024	Cambridge University Press	64	3	Q1	71
Williyan, A., Fitriati, S. W., Pratama, H., & Sakhiyya	Teaching English with Technology	2024	University of Nicosia	34	1	Q1	21
Zhao, Panzhen; Hassan, Aminuddin; Burhanuddin, Nur Aimi Nasuha	Cogent Education	2024	Taylor and Francis Ltd.	3	3	Q2	43
Chimeva, Y., & Trenchs-Parera, M.	ReCALL	2024	Cambridge University Press	4	1	Q1	71
Muñoz-Basols, Javier; Craig, Neville; Lafford, Barbara A.; Godev, Concepción	Hispania	2023	John Hopkins University	46	4	Q3	19
Wiboolyasarin,	Journal of	2023	Ubiquity Press	5	1	Q1	20

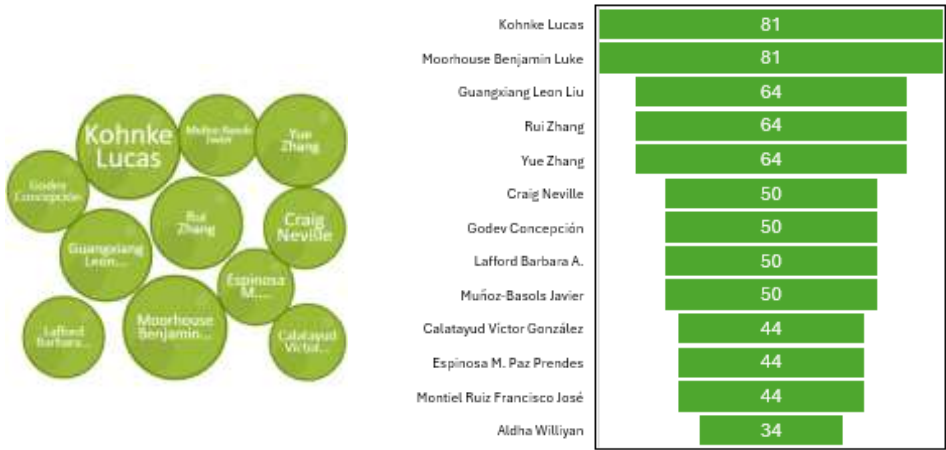
Authors	Journal	Publication year	Publisher	Cited	Number of institutions involved	Quartile	H-Index
Watcharapol	Interactive Media in Education						
Taghizadeh, Mahboubeh; Ejtehadi, Atena	Computer Assisted Language Learning	2023	Routledge	36	1	Q1	86
Moorhouse, Kohnke	RELC Journal	2021	SAGE Publications Ltd	81	2	Q1	55
Prendes Espinosa, Montiel Ruiz, González Calatayud	Publicaciones de la Facultad de Educacion y Humanidades del Campus de Melilla	2021	Universidad de Granada	1	2	Q4	12

Note. Created by the authors

Figure 4 shows the most frequently cited authors in the literature reviewed for this study. The author-level analysis reveals a strong concentration of citations in the works of a few scholars. Two authors, Kohnke, Lucas, and Moorhouse, and Benjamin Luke, lead the sample with 81 citations each, jointly accounting for 20.6% of the 788 citations in the dataset. A second tier includes Guangxiang Leon Liu, Rui Zhang, and Yue Zhang, each with 64 citations, contributing 45% of all citations. An intermediate group of four authors—Craig Neville, Concepción Godev, Barbara A. Lafford, and Javier Muñoz-Basols—accumulates 50 citations each; with them, the top nine names represent $\approx 70.3\%$ of the total impact. Further down are Víctor González Calatayud, M. Paz Prendes Espinosa, and Francisco José Montiel Ruiz, each with 44 citations; and, finally, Aldha Williyan, Hendi Pratama, and Sri Wuli Fitriati, each with 34, collectively representing the remaining 12.9%.

Figure 4

Most frequently cited authors in the literature reviewed for this study.



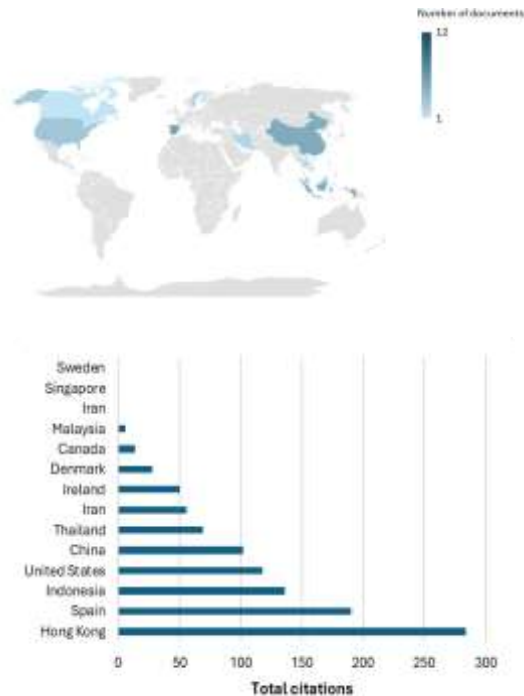
Note. Created by the authors

Figure 5 shows the distribution of countries' citations in the field of research on digital ecologies of learning. Geographic distribution highlights a marked concentration of impact in Asia: Hong Kong (12 articles; 284 citations, 27% of the total) leads, followed by Spain (6; 190, 18%), and a cluster comprising Indonesia (5; 136, 12.9%), the United States (3; 118, 11.2%), and China (5; 102, 9.7%). Collectively, these top five jurisdictions account for 79% of all citations while representing 58.5% of the articles. By region, Asia accounts for 62% of citations and 68% of articles, Europe for 25.5%, and North America for 12.5%.

Figure 5
Distribution of countries' citations in the field of research based on digital ecologies of learning.

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Note. Created by the authors

Figure 6 shows the relationship between the total number of citations and the number of documents per journal. Editorial prestige, approximated by the H-Index, shows that the historical authority of a journal does not necessarily translate into higher impact within this sample. TESOL Quarterly ($H=131$), British Journal of Educational Psychology ($H=120$), and System ($H=115$) are among the most recognized journals in the field; others, such as Language Teaching ($H=87$), Computer Assisted Language Learning ($H=86$), and ReCALL ($H=71$), also rank highly. However, the articles included from TESOL Quarterly and British Journal of Educational Psychology accumulated only one citation each, while Language Teaching registered none. The above suggests possible effects of recency, topic-specific focus, or sample size. In contrast, journals with intermediate H-Index values, such as

RELIC Journal (H=55) and ReCALL, concentrate a significant share of observed citations, while Hispania (H=19) features a particularly influential article (46 citations).

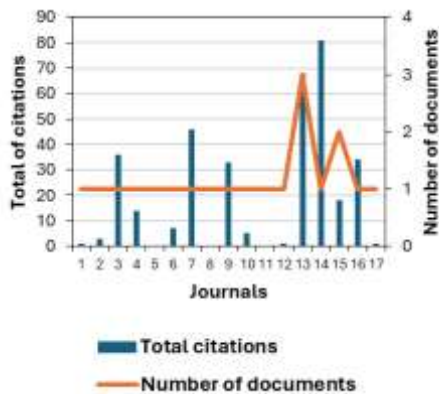
3.2 Final Discussion

Now, in the answer to the review questions, what evidence exists on the role of digital ecologies in the development of English language (EFL) teachers' pedagogical practices? How is the transformation of L2 teachers' pedagogical practice in secondary education perceived in digital environments? How are learning environments reconfigured through digital immersion? This review presents the following analysis in response to the question posed in the introduction.

RQ1: What evidence exists on the role of digital ecologies in the development of pedagogical practices of English language (EFL) teachers?

Figure 6

Relationship between the total number of citations and the number of documents per journal.



1	British Journal of Educational Psychology
2	Cogent Education
3	Computer Assisted Language Learning
4	Computers and Education: X Reality
5	Edelweiss Applied Science and Technology
6	Education Inquiry
7	Hispania
8	International Journal of Learning, Teaching and Educational Research
9	International Journal of Multilingualism
10	Journal of Interactive Media in Education
11	Language Teaching
12	Publicaciones de la Facultad de Educacion y Humanidades del Campus de Melilla
13	ReCALL
14	RELIC Journal
15	System
16	Teaching English with Technology
17	TESOL Quarterly

Note. Created by the authors

Language learning in the digital age has been strengthened by the emergence of multiple interactions between individuals and their virtual environments (Yüksel et al., 2025). The way in which technology transversalizes the dynamics of communicative development in L2 proposes a panorama in which ecological factors such as cognitive development at the linguistic level, EFL pedagogical praxis, socio-cultural relations, institutionality, and motivation (Hoerudin, 2025; Zadorozhnyy et al., 2025), radically transform the communicative approach towards a meaningful and innovative perspective in which the learner is an active, autonomous, motivated actor, equipped with multiple physical and digital resources that combine to provide a more enriching experience towards the development of communicative competence in the second language (Jones et al., 2025; Qoura, 2021)

RQ2: How is the transformation of the pedagogical practice of L2 teachers in secondary education perceived from digital environments?

In the context of secondary school, teachers continually reconfigure their practice, as technology redesigns the curriculum and transforms traditional environments into dynamic virtual learning environments (VLEs) where informal digital learning (IDLE) (Liu et al., 2024; Medina-Alarcón, 2025; Muñoz-Basols et al., 2023) breaks linear schemes of formative horizontality and transcends the classroom to increase individual and collective practice; as well as the willingness to communicate (WTS) (Hoyos González & Morales Benítez, 2023; Yuditseva, 2024) through various attractive media for learners. Thus, pedagogical strategies such as task-based learning (TBLT) (Chimeva & Trenchs-Parera, 2024; Wiboolyasarín, 2023), when implemented through integrated platforms, enhance teachers' work and, consequently, the development of communicative competence in L2.

RQ3: How are learning scenarios reconfigured through digital immersion?

Now the relevant phenomenon underlying digital immersion in which L2 language practices are found is the increase in confidence and security in linguistic practice (Mendoza et al., 2025; Rubio Jaramillo, 2025); technologies such as Virtual Reality (Muñoz-Basols et al., 2023; Febring & Risenfors 2025) implemented as a teaching resource for simulated immersion

or Second Life, provide greater disposition by becoming safe spaces in which interaction becomes natural and diversified, according to the individual's levels of competence in the use of the language. In this sense, motivation also involves a fundamental process that increases the willingness to communicate (WTC) (Alemi et al., 2025), thereby decreasing anxiety and enhancing sensations in communicative practice, which in turn improves individual performance. It is assumed that the attitude of the training group's environment is a crucial determinant (Lee & Jeon, 2024; Jiménez Becerra, 2020), as specific characteristics can either facilitate or hinder the acquisition and development of communicative skills.

Technology is infiltrating pedagogical practice (Taghizadeh & Ejtehad, 2023). More teachers are associating emerging technologies as external support agents for the planning, execution, and evaluation of classes, for example, the co-authorship of Artificial Intelligence (AI) in the creation of teaching materials such as targeting content, feedback activities, and evaluation exercises from various pedagogical models and/or strategies.

Finally, in response to guide question 3, it is essential to understand and overcome the existing barriers at the individual, socio-familial, institutional, and governmental levels that affect ecological learning environments from the multiple perspectives of the subjects immersed in them. These include teachers with low levels of digital competence, those who independently qualify themselves from a technological empiricist perspective to respond to the language training needs of the 21st century; students who are insecure and have limited access to technological media and internet; parents who are wary of the use of technology in school settings due to their association with distraction and leisure; the adaptation of a curriculum to the specific pedagogical needs of the context; standardized assessments proposed by government policies that are inconsistent with the processes of communicative significance in L2; and many other perspectives that demonstrate that technology in the classroom is a field with many elements yet to be explored.

The perspective of digital learning ecologies in English teaching offers, based on literature, a holistic framework in which the acquisition of English as a second language becomes a dynamic process primarily influenced by digitality, integrating diverse elements at a systemic level that consider physical, social, cultural, and technological factors as inherent shapers of new

L2 learning experiences in multiple educational settings. In this way, multiple approaches such as IDLE or Informal Digital Learning (Liu et al., 2024), VLE or virtual learning environments (Wiboolyasarini, 2023), CEA or applied translation (Muñoz-Basols et al., 2023) materialize from pedagogical strategies implemented in classrooms and communicative practice environments in favor of the integration of digital and technological tools such as artificial intelligence, virtual reality, applications, and online platforms that allow for personalized learning.

3.3 Limitations of the study

This systematic review considers several factors that may have influenced the study's results, leading to a rigorous approach to the data and a reflective, critical one in the analyses underlying the process (Marín, 2022). First, restricting the search to a single database like Scopus, which, although considered a reliable research repository, does not provide complete coverage of sources about the study, thus preventing a comprehensive review of the literature focused on digital learning ecologies. This biased the results of other studies that could have contributed accurate conclusions to the development of this research. Likewise, other influential factors from this perspective may include the filtered years from 2020 to the present, which could have excluded valuable studies from earlier years.

The limitations of the PRISMA development method led to review biases by the author regarding the inclusion and exclusion criteria for studies. Due to the limited literature on digital learning ecologies specifically focused on teaching English as a foreign language, studies on digital learning environments were included under other terminology, and research in fields associated with digital environments or ecosystems was selected. This may generate limitations and impact the final result.

Based on these limitations, future research is encouraged to expand the review of documents in other databases. This would allow for the inclusion of studies in other languages and over a longer time frame, and even the consideration of grey literature, which could yield valuable results. Furthermore, this expanded literature could identify more studies using an empirical approach and mixed methods, enabling data analysis from an applied perspective across diverse educational and sociocultural contexts.

4. Conclusion

In conclusion, this systematic review shows that digital learning ecologies constitute a relevant framework for understanding the transformation of English as a Foreign Language (EFL) teaching in contemporary educational contexts. From our perspective, these ecologies go beyond the simple incorporation of digital tools, as they involve the reconfiguration of pedagogical practices, the interaction between human and technological actors, and the development of communicative, digital, critical, and ethical competencies. Therefore, digital learning ecologies should be understood as dynamic, adaptive, and contextual systems that respond to the current demands of language learning in both formal and informal educational settings.

The findings of this review have important pedagogical implications. They suggest the need to design more flexible, personalized, and collaborative learning environments that recognize students' cognitive, effective, social, cultural, and technological dimensions. In this sense, digital technologies can strengthen self-directed learning, didactic innovation, and communicative interaction in EFL contexts. However, their implementation also requires teacher training, institutional support, and critical reflection on the educational use of technology, especially in contexts where technological, social, and pedagogical gaps continue to limit equitable access to digital learning opportunities.

The main limitation of this systematic review is that it was restricted to the Scopus database and to studies published from 2020 onward, potentially excluding relevant research on digital learning ecologies. In addition, the limited body of literature specifically addressing this topic in EFL teaching necessitated the inclusion of studies on digital learning environments and digital ecosystems, which may have influenced the findings. Therefore, future research should broaden the search to include additional databases, languages, time periods, and grey literature to provide a more comprehensive and diverse understanding of digital learning ecologies across different educational and sociocultural contexts.

Declarations

Ethical Approval

Not applicable. This study is a literature review and did not involve human or animal participants.

Authors' Contributions

Jeisson Celis M.: Methodology, Investigation, Software, Formal analysis, Validation, Writing – original draft, Writing – review & editing. Luis F. Cardona: Methodology, Investigation, Software, Formal analysis, Validation, Writing – original draft, Writing – review & editing.

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Availability of Data and Materials

The datasets generated and analyzed during the current study are available from the corresponding author on request.

Conflicts of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Use of Artificial Intelligence

The authors declare that Grammarly was used as an AI-assisted tool to improve grammar, spelling, punctuation, and the clarity of the English writing. It was not used to generate scientific content, conduct the literature review, analyze data, interpret results, develop conclusions, or make methodological decisions. The authors reviewed, edited, and took full responsibility for the final content of the manuscript.

References

- Alemi, M., Khanlarzadeh, N., & Tajeddin, Z. (2025). Early career language teachers' motivation in the making: An ecological perspective on their motivational resources. *System*, 132, Article 103685. <https://doi.org/10.1016/j.system.2025.103685>

- Alva Miguel, W. H., Matos Huamán, C., Wong Fajardo, E. M., & Zúñiga Reynoso, C. (2023). Implementación de la educación virtual y resistencia al cambio en docentes de una institución de educación superior de Lima metropolitana. Lima. 2022. *Educare et Comunicare: Revista de Investigación de la Facultad de Humanidades*, 10(2), 101–108. <https://doi.org/10.35383/educare.v10i2.872>
- Botelho, T. C., Duarte, S. P., Ferreira, M. C., Ferreira, S., & Lobo, A. (2025). Simulator and on-road testing of truck platooning: A systematic review. *European Transport Research Review*, 17, Article 4. <https://doi.org/10.1186/s12544-024-00705-6>
- Bronfenbrenner, U. (1994). Ecological models of human development. En *International Encyclopedia of Education* (2.^a ed., Vol. 3). Elsevier. Reimpreso en M. Gauvain & M. Cole (Eds.), *Readings on the development of children* (2.^a ed., pp. 37–43). Freeman.
- Caviglia, F., Boie, M. A. K., Dalsgaard, C., & Pedersen, A. Y. (2024). Bringing digital competence to the disciplines. *Education Inquiry*, 1–29. <https://doi.org/10.1080/20004508.2024.2318842>
- Chimeva, Y., & Trenchs-Parera, M. (2024). Different interlocutors, different EFL interactional strategies: A case study of intercultural telecollaborative projects in secondary classrooms. *ReCALL*, 36(1), 104–118. <https://doi.org/10.1017/S0958344023000228>
- Chun, D. M., Kern, R., & Smith, B. (2016). Technology in language use, language teaching, and language learning. *The Modern Language Journal*, 100(S1), 64–80. <https://doi.org/10.1111/modl.12302>
- Ciapponi, A. (2021). La declaración PRISMA 2020: Una guía actualizada para reportar revisiones sistemáticas. *Evidencia, Actualización en la Práctica Ambulatoria*, 24(3), e002139. <https://doi.org/10.51987/evidencia.v24i4.6960>
- Costan, E., Gonzales, G., Gonzales, R., Enriquez, L., Costan, F., Suladay, D., Atibing, N. M., Aro, J. L., Evangelista, S. S., Maturan, F., Selerio, E., Jr., & Ocampo, L. (2021). Education 4.0 in developing economies: A systematic literature review of implementation barriers and future research agenda. *Sustainability*, 13(22), Article 12763. <https://doi.org/10.3390/su132212763>
- Febring, L., & Risenfors, S. (2025). Teachers’ articulations of digital resources in an upper secondary programme for newly arrived migrants. *ReCALL*, 37(2), 267–282. <https://doi.org/10.1017/S0958344024000326>

- Finfeld, D. L. (2003). Metasynthesis: The state of the art—so far. *Qualitative Health Research*, 13(7), 893–904. <https://doi.org/10.1177/1049732303253462>
- Hernández-Serrano, M. J., Morales-Romo, N., Gago-Rivas, V., & García-Gutiérrez, C. (2025). Conectando competencias digitales y sociales en un marco flexible y adaptativo para docentes de Formación Profesional. *RIED-Revista Iberoamericana de Educación a Distancia*, 28(1), 323–346. <https://doi.org/10.5944/ried.28.1.41470>
- Herrera Mosquera, L. (2017). Impact of implementing a virtual learning environment (VLE) in the EFL classroom. *Íkala, Revista de Lenguaje y Cultura*, 22(3), 479–498. <https://doi.org/10.17533/udea.ikala.v22n03a07>
- Hoerudin, C. W. (2025). Towards a digital ecology of language learning: An integrative interaction model within the virtual education landscape. *Edelweiss Applied Science and Technology*, 9(4), 1591–1603. <https://doi.org/10.55214/25768484.v9i4.6342>
- Hoyos González, K., & Morales Benítez, M. Y. (2023). Incidencia de la transformación de la práctica pedagógica en el desarrollo de la oralidad en inglés, en los estudiantes de un aula de procesos básicos. *Infancias Imágenes*, 21(1), 99–111. <https://revistas.udistrital.edu.co/index.php/infancias/article/view/20768>
- Jiménez Becerra, I. (2020). Rasgos y tendencias de la didáctica con TIC: Retos a partir de la nueva ecología del aprendizaje. *Estudios Pedagógicos (Valdivia)*, 46(2), 215–229. <https://doi.org/10.4067/S0718-07052020000200215>
- Jones, S. A., Loh, C. E., & Sabnani, R. L. (2025). Research in English language teaching and learning in Singapore: 2017–2023. *Language Teaching*, 1–23. <https://doi.org/10.1017/S0261444825000114>
- Lee, S., & Jeon, J. (2024). Teacher agency and ICT affordances in classroom-based language assessment: The return to face-to-face classes after online teaching. *System*, 121, Article 103218. <https://doi.org/10.1016/j.system.2023.103218>
- Liu, G. L., Zhang, Y., & Zhang, R. (2024). Examining the relationships among motivation, informal digital learning of English, and foreign language enjoyment: An explanatory mixed-method study. *ReCALL*, 36(1), 72–88. <https://doi.org/10.1017/S0958344023000204>
- Lu, C., Gu, M. M., & Lee, J. C. K. (2025). A systematic review of research on translanguaging in EMI and CLIL classrooms. *International Journal of Multilingualism*, 22(2), 1033–1053. <https://doi.org/10.1080/14790718.2023.2256775>

- Luckin, R. (2008). The learner centric ecology of resources: A framework for using technology to scaffold learning. *Computers & Education*, 50(2), 449–462. <https://doi.org/10.1016/j.compedu.2007.09.018>
- Maeda, Y., Caskurlu, S., Kenney, R. H., Kozan, K., & Richardson, J. C. (2022). Moving qualitative synthesis research forward in education: A methodological systematic review. *Educational Research Review*, 35, Article 100424. <https://doi.org/10.1016/j.edurev.2021.100424>
- Marín, V. I. (2022). La revisión sistemática en la investigación en tecnología educativa: Observaciones y consejos. *RiiTE Revista Interuniversitaria de Investigación en Tecnología Educativa*, 13, 62–79. <https://doi.org/10.6018/riite.533231>
- Medina-Alarcón, C. V. (2025). Transformación en las concepciones docentes de la enseñanza de una lengua extranjera: Una revisión sistemática. *Portal de la Ciencia*, 6(1), 18–32. <https://doi.org/10.51247/pdlc.v6i1.399>
- Mendoza, N. B., Zadorozhnyy, A., & Dizon, J. I. W. T. (2025). A rising tide lifts all boats: The social contagion of achievement in L2 classrooms and the role of intrinsic motivation and engagement. *British Journal of Educational Psychology*. <https://doi.org/10.1111/bjep.12752>
- Meniado, J. C. (2023). Digital language teaching 5.0: Technologies, trends and competencies. *RELC Journal*, 54(2), 461–473. <https://doi.org/10.1177/00336882231160610>
- Monsalve Lorente, L., & Aguasanta Regalado, M. E. (2020). Nuevas ecologías del aprendizaje en el currículo: La era digital en la escuela. *Revista Latinoamericana de Tecnología Educativa - RELATEC*, 19(1), 139–154. <https://doi.org/10.17398/1695-288X.19.1.139>
- Moorhouse, B. L., & Kohnke, L. (2021). Responses of the English-language-teaching community to the COVID-19 pandemic. *RELC Journal*, 52(3), 359–378. <https://doi.org/10.1177/00336882211053052>
- Msimango, W. N. (2025). Empowering pre-service teachers to enhance inclusive education through technology: Digital pedagogy as a catalyst for empowering South African pre-service teachers. En *Empowering Pre-Service Teachers to Enhance Inclusive Education Through Technology* (pp. 59–86). IGI Global. <https://doi.org/10.4018/979-8-3693-8759-7.ch003>
- Muñoz-Basols, J., Neville, C., Lafford, B. A., & Godev, C. (2023). Potentialities of applied translation for language learning in the era of artificial intelligence. *Hispania*, 106(2), 171–194. <https://doi.org/10.1353/hpn.2023.a899427>

- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Alonso-Fernández, S. (2021). Declaración PRISMA 2020: Una guía actualizada para la publicación de revisiones sistemáticas. *Revista Española de Cardiología*, 74(9), 790–799. <https://doi.org/10.1016/j.recesp.2021.06.016>
- Prendes Espinosa, M. P., Montiel Ruiz, F. J., & González Calatayud, V. (2021). Uso de TIC por parte del profesorado de enseñanza secundaria analizado a partir del modelo de ecologías de aprendizaje: Estudio de caso en la región de Murcia. *Publicaciones*, 51(3), 109–135. <https://doi.org/10.30827/publicaciones.v51i3.18374>
- Qoura, D. A. A. S. (2021). The teaching and learning of English language in the digital transformation era. *International Journal of E-Learning*, 1(3), 11–27. <https://doi.org/10.21608/ijel.2021.163396>
- Riyanda, A. R., Dewi, I. P., Jalinus, N., Sagala, M. K., Rinaldi, D., Prasetya, R. A., & Yanti, F. (2025). Digital skills and technology integration challenges in vocational high school teacher learning. *Data and Metadata*, 4, Article 553. <https://doi.org/10.56294/dm2025553>
- Rubio Jaramillo, L. F. (2025). Inteligencia artificial y competencias comunicativas en inglés: Una revisión sistemática con enfoque crítico. *Revista Temas de Comunicación*, 50, 6–30. <https://doi.org/10.62876/tc.vi50.7609>
- Sánchez-Serrano, S., Pedraza-Navarro, I., & Donoso-González, M. (2022). How to conduct a systematic review under PRISMA protocol? Uses and fundamental strategies for its application in the educational field through a practical case study. *Bordón. Revista de Pedagogía*, 74(3), 51–66. <https://doi.org/10.13042/Bordon.2022.95090>
- Taghizadeh, M., & Ejtehad, A. (2023). Investigating pre-service EFL teachers' and teacher educators' experience and attitudes towards online interaction tools. *Computer Assisted Language Learning*, 36(8), 1633–1667. <https://doi.org/10.1080/09588221.2021.2011322>
- Wiboolyasar, W. (2023). Can a virtual task-based language learning environment enhance pre-service teachers' performance? Comparing non- and users of iPad. *Journal of Interactive Media in Education*. <https://doi.org/10.5334/jime.802>
- Williyan, A., Fitriati, S. W., Pratama, H., & Sakhiyya, Z. (2024). AI as co-creator: Exploring Indonesian EFL teachers' collaboration with AI in content development. *Teaching English with Technology*, 24(2), 5–21. <https://doi.org/10.56297/vaca6841/LRDX3699/RZOH5366>
- Yang, X., Shen, J., Cropley, D. H., & Zheng, Y. (2025). A systematic review of factors influencing K-12 teachers' creative teaching across different forms: An ecological perspective. *Thinking Skills and*

Creativity, Article 101869.

<https://doi.org/10.1016/j.tsc.2025.101869>

- Yudintseva, A. (2024). An exploration of low- and high-immersive virtual reality modalities for willingness to communicate in English as a second language. *Computers & Education: X Reality*, 5, Article 100076. <https://doi.org/10.1016/j.cexr.2024.100076>
- Yüksel, A. O., Atasoy, B., & Özdemir, S. (2025). Transformation of labor: Educational robotics coding in elementary schools for 21st century skills. *Entertainment Computing*, 52, Article 100890. <https://doi.org/10.1016/j.entcom.2024.100890>
- Zadorozhnyy, A., Winsy, L. W. Y., & Lee, J. S. (2025). EFL teachers' ecological barriers to integrating informal digital learning of English. *TESOL Quarterly*. <https://doi.org/10.1002/tesq.3400>
- Zhao, P., Hassan, A., & Burhanuddin, N. A. N. (2024). A systematic review of factors influencing English language competency for ethnic minority students: An ecological systems theory perspective. *Cogent Education*, 11(1), Article 2415730. <https://doi.org/10.1080/2331186X.2024.2415730>
- Zhao, P., Hassan, A., Burhanuddin, N. A. N., & Shi, L. (2025). Factors affecting the English language competency among minority nationality junior high school students: A qualitative inquiry. *International Journal of Learning, Teaching and Educational Research*, 24(3), 586–609. <https://doi.org/10.26803/ijlter.24.3.28>



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