International Journal of Technology in Education and Science

www.ijtes.net

Mapping the Intersection of MOOCs, AI Literacy, and Multilingual Academic Writing: A Bibliometric Analysis of Global Research Trends and Knowledge Structures

Gaukhar Yersultanova [1], Zhanar Zhyltyrova [2 *], Aidos Myrzabek [3], Zulyar Kavshev [4], Ainur Aliyeva [5]

[1] Abai Kazakh National Pedagogical University, Almaty, & SDU University, Kaskelen, Kazakhstan, 0000-0001-8913-6067
[2] JSC "Kazakh Ablai Khan University of International Relations and World Languages", Kazakhstan, 0000-0003-2963-2610
[3] SDU University, Kaskelen,, Kazakhstan, 0000-0002-6879-3866
[4] SDU University, Kaskelen,, Kazakhstan, 0000-0002-2157-1836
[5] Al-Farabi Kazakh National University, Kazakhstan, 0009-0000-2129-0842
[*] Corresponding author: Zhanar Zhyltyrova (zhanarzht1@gmail.com)

Article Info

Article History

Received:
18 February 2026

Revised:
17 May 2026

Accepted:
11 June 2026

Published:
15 June 2026

Keywords

AI literacy
Multilingual academic writing
Massive Open Online Courses (MOOCs)
Higher education
Bibliometric analysis

Abstract

This study aims to examine scientific publications produced at the intersection of massively open online courses (MOOCs), AI literacy, and multilingual academic writing using bibliometric methods, covering the period from 2020 to 2026. Thirty-eight publications obtained from the Web of Science and Scopus databases and scanned according to the PRISMA protocol form the focus of the bibliometric analysis performed via VOSviewer software and the qualitative content analysis conducted using a mixed inductive-deductive approach. The findings reveal a significant and accelerating upward trend in publication volume during the period examined. This increase, particularly accelerating from 2023 onwards, coincides with the widespread integration of generative AI tools into academic contexts. Geographic distribution shows a dominance of China-based institutions; however, studies from countries such as Rwanda, Kazakhstan, and Indonesia also contribute to discussions on linguistic justice and multicultural representation in the literature. Keyword co-occurrence analysis revealed four core conceptual clusters: AI literacy frameworks and academic writing norms; technology-assisted language learning and student outcomes; ethical concerns and critical gaps; and language MOOCs and cultural context. Content analysis findings were structured around three interconnected thematic frameworks: multilingual academic writing and AI-assisted literacy tools; technological and institutional variables influencing AI adoption; MOOC design and the pedagogical implications of AI literacy in multilingual language education. The study emphasizes the need for MOOC design to be sensitive to the identities of multilingual learners and for the systematic integration of AI literacy components into higher education programs. As one of the first bibliometric studies to address these three areas together, the research provides a unique reference framework for the fields of educational sciences, Applied Linguistics and science of science.

Citation: Yersultanova, G., Zhyltyrova, Z., Myrzabek, A., Kavshev, Z., & Aliyeva, A. (2026). Mapping the intersection of MOOCs, AI literacy, and multilingual academic writing: A bibliometric analysis of global research trends and knowledge structures. *International Journal of Technology in Education and Science (IJTES), 10*(4), 850-875. https://doi.org/10.46328/ijtes.8537

ISSN: 2651-5369 / © International Journal of Technology in Education and Science (IJTES).

Introduction

In the digital age, where information production is redefined in terms of speed, scale, and accessibility, educational research is also undergoing a transformation. Particularly with the proliferation of AI-powered learning ecosystems, the transformation of the digital academic writing process and the development of globally accessible higher education models are among the key variables in this transformation in higher education. Massive open online courses (MOOCs), emerging as innovative learning environments aimed at democratizing higher education, supporting lifelong learning and expanding access to information globally, have undergone not only technological but also pedagogical and sociocultural transformations over time (Reich & Ruipérez-Valiente, 2019; Naidu, 2020).

AI literacy has transformed into an interdisciplinary research field encompassing individuals' ability to understand, critically evaluate and use AI systems within ethical boundaries. It has become central to discussions on educational policies, instructional design, and digital competence (Kong et al., 2025; Krumsvik, 2024). Multilingual academic writing studies have reopened the debate on the relationships between language, identity, digital tool use and academic discourse with the globalization of academic production. The rise of AI-powered writing tools, in particular, has made this field even more critical (Canagarajah, 2024; McCarville, 2026).

A review of the existing literature reveals that these research areas have largely developed within their own theoretical boundaries. While MOOC research mostly focuses on learner engagement, completion rates, and online learning experiences (Reich, 2015; Shah & Khanna, 2022), the AI literacy literature is rapidly expanding around conceptual framework development, teacher competencies and ethical use (Stolpe & Hallström, 2024; Yetişensoy & Rapoport, 2023). Multilingual academic writing studies, on the other hand, concentrate around the impact of digital writing tools on academic production processes, language policies, and translingual approaches (Almashour et al., 2025; Şerban-Oprescu, 2021). However, a holistic and systematic bibliometric study examining MOOCs, AI literacy, and multilingual academic writing within the same analytical framework is not found in the literature. In this context, bibliometric analysis is more than just a method that provides a quantitative overview of existing knowledge. This approach stands out as a strategic analysis method that reveals research trends, thematic concentrations, collaboration networks and interdisciplinary knowledge flows (Zhang & Chen, 2022).

Especially in today's world, where AI-supported academic production processes are accelerating, mapping the knowledge networks between these three fields has the potential to offer significant insights into the future of educational technologies, digital pedagogies and academic communication studies. Accordingly, the aim of this study is to systematically reveal research trends, thematic clusters, citation structures and interdisciplinary connections by examining publications produced in the fields of MOOCs, AI literacy, and multilingual academic writing between 2020 and 2026 using bibliometric methods. Thus, the study aims not only to make a unique contribution to the educational scientific literature, but also to develop a data-driven strategic perspective for researchers, policymakers and higher education institutions.

Literature and Theoretical Framework

Educational Impact of MOOCs

MOOCs, having entered the digital education landscape in the early 2010s, quickly generated widespread interest and debate on a global scale. These platforms were positioned as a radical educational model promising to overcome the limitations of the traditional higher education system and democratize access to knowledge. However, questions regarding the pedagogical effectiveness and sustainability of MOOCs have remained on the agenda from the outset. Accordingly, a comprehensive research tradition has emerged focusing on the types of learning experiences offered by MOOC platforms and how these experiences can be evaluated compared to traditional educational models (Reich, 2015; Spoerhase, 2015; Gad-el-Hak, 2015). These discussions have paved the way for a perspective that views MOOCs not merely as a technological innovation, but as a proposal for a fundamental transformation in educational philosophy and pedagogy. Within this perspective, various comparative evaluations have been conducted regarding the scalability, accessibility and content quality of MOOCs, while also questioning the extent to which these platforms have fulfilled their promised potential for democratizing education. Furthermore, structural problems such as low completion rates and homogeneity of learner profiles have been among the focal points of early research (Simonson, 2015; Gonon, 2015). In this context, MOOCs have become a decisive point of reference in the field of education despite their unique pedagogical and institutional limitations. Indeed, over time, research examining the role of these platforms in education has evolved beyond mere criticism, adopting a more constructive approach that encourages suggestions for improvement and redesign. Therefore, the first wave of MOOC literature can be considered a ground for discussion where both possibilities and vulnerabilities are honestly addressed.

In the second phase of MOOC research, more empirical and data-driven studies focusing on learner behaviors, motivational patterns, and factors determining platform success began to emerge. Research conducted during this period examined the demographic characteristics, engagement patterns, and completion behaviors of MOOC learners in detail; revealing significant differences from platform to platform and context to context (Pursel et al., 2016; Saadatdoost et al., 2019). Accordingly, research conducted in the Chinese context highlighted that MOOC use is directly influenced by cultural and institutional factors; it was suggested that student motivation and self-regulation skills play a decisive role in this process (Zhang & Chen, 2022). In addition, studies aiming to explain high dropout rates in MOOCs and develop strategies to reduce these rates have presented various pedagogical and design suggestions for increasing platform engagement (Tay & Musib, 2017).

Research on how MOOCs are adapted in the context of foreign language teaching has shown that it is possible to integrate these platforms with culture-specific content and language teaching models (Kim & Kim, 2016). Similarly, conceptual and methodological frameworks have been developed to measure MOOC success; variables such as student satisfaction and intention to continue have gained a central position in this process (Shah & Khanna, 2022). In this context, it is observed that MOOC research is increasingly becoming more data-driven, fact-oriented, while the learner experience is being addressed in a multidimensional way. Accordingly, recent studies have evaluated MOOC users within the framework of design principles and have generated new research questions on the quality and continuity of participation. (Ślósarz, 2025; Naidu, 2020; Reich & Ruipérez-Valiente, 2019).

Conceptualizing AI Literacy in Educational Contexts

The concept of AI literacy is becoming central to both academic and policy discussions as technology rapidly permeates educational environments. The debate over defining the concept, determining its scope, and framing it within the educational context is not yet concluded. On the contrary, it continues to be a dynamic field of discussion to which researchers contribute from different disciplinary perspectives. In this context, AI literacy is conceptualized not merely as the sum of technical skills, but as a holistic understanding of competence encompassing critical thinking, ethical awareness and social responsibility (Kong et al., 2025; Stolpe & Hallström, 2024). This holistic approach emphasizes the balance between understanding and using of AI responsibly, necessitating the positioning of the individual as both a technological and a social actor. Indeed, research developed within this framework has attempted to reveal the components of AI literacy through various theoretical models. Efforts to create conceptual maps and teaching frameworks have made significant contributions to the field (Yue Yim, 2024).

The integration of AI literacy into teacher training stands out as a distinct and significant subfield in the literature. The extent to which teachers and academics understand AI concepts, their attitudes and beliefs regarding these concepts, and how these are reflected in classroom practices constitute central questions in many studies (Kelley & Wenzel, 2025). However, it is also argued that the inclusion of AI literacy components in educational programs is not merely a matter of technical capacity, it requires a comprehensive transformation process that must be addressed with pedagogical, ethical and institutional dimensions (Kelley & Wenzel, 2025). Therefore, the question of how prepared faculties are for this transformation and how they adapt is increasingly prominent in the literature.

Research examining the effectiveness of AI literacy interventions in pre-service and in-service training programs plays a critical role in developing practical recommendations (Rachbauer et al., 2025). In this context, it is emphasized that the integration of AI literacy into teacher training should be addressed at both individual and institutional levels, and that individual skill development alone is not sufficient (Krumsvik, 2024).

Multilingual Academic Writing: Challenges, Pedagogies and Digital Mediation

Multilingual academic writing is becoming a focal point of educational research in higher education, along with the increasing diversity of students and academics. Studies in this field suggest that academic writing is not merely a grammatical and rhetorical act, it is also a complex social practice in which identity, power, and the order of academic discourse are reproduced (Canagarajah, 2024; Şerban-Oprescu, 2021). In this context, the participation of multilingual writers in academic discourse is intertwined with significant linguistic and cultural challenges in publishing environments dominated by monolingual academic norms. Questions concerning how academic writing practices in languages other than English are evaluated, and how multilingual identities are negotiated within academic contexts, lie at the core of these challenges (Solli & Ødemark, 2019). Furthermore, how academic writing centers and institutional support structures contribute to the development of multilingual writers is also an

important subtopic of interest for researchers. The multilingual academic writing literature offers an integrated research perspective that connects the dimensions of language policy, pedagogy and institutional regulation (Kaufhold & Yencken, 2021).

Today, more inclusive perspectives, such as the experiences of neurodiverse multilingual students specific to academic writing processes, are beginning to be included in into this body of literature (McCarville, 2026). Accordingly, it is understood that the research agenda of multilingual academic writing is becoming increasingly inclusive and intersectional. The integration of digital tools and AI-driven feedback systems into multilingual academic writing processes constitutes a significant research axis in the literature. In this context, the effects of automated feedback tools on the writing practices of multilingual learners have been examined. It has been observed that these tools both support writing quality and lead to various pedagogical and identity-based concerns (Zhang & Xu, 2024; Almashour et al., 2025). Indeed, research focusing on how translanguaging practices occur in digital feedback environments has revealed that multilingual learners mobilize their linguistic repertoires in creative ways. However, algorithmic systems sometimes take on forms that suppress this diversity in this process (Almashour et al., 2025).

Moreover, how digital storytelling and multimodal applications in academic writing expand the expressive repertoire of multilingual writers is also a topic that attracts the attention of researchers (Bloch, 2018). In this context, pedagogical approaches used in teaching academic writing to multilingual students have been systematically examined, and it has been emphasized that instructional design should be sensitive to both linguistic and cultural dimensions (Jiang & Luo, 2019). All these findings reveal that digital mediation both enables and reshapes multilingual academic writing environments, strongly supporting the need to examine this process from a critical perspective.

Research Objective and Research Questions

This bibliometric study is guided by the following research questions which collectively aim to map the thematic landscape, structural properties and content-level orientations of the scholarly literature situated at the intersection of Massive Open Online Courses (MOOCs), artificial intelligence (AI) literacy and multilingual academic writing:

RQ1. How has the volume of publications at the intersection of MOOCs, AI literacy, and multilingual academic writing evolved between 2020 and 2026?

RQ2. Which countries, journals, and institutional affiliations have produced the highest volume of publications in this domain?

RQ3. What are the most frequently cited works, key co-authorship networks, and dominant keyword structures in the field?

RQ4. What are the dominant themes, sub-themes, and categories that characterize the content of the identified studies, and how do these thematic clusters relate to the overarching research foci of multilingual academic writing, AI-assisted literacy tools, technological and ethical variables in AI adoption, and MOOC design for multilingual learners?

Method

Research Design

This study employs a bibliometric analysis design, a scientometric approach that enables systematic, quantitative mapping of a research domain through the examination of publication patterns, citation structures, co-authorship networks and keyword co-occurrence (Donthu et al., 2021; Aria & Cuccurullo, 2017). Bibliometric analysis has been increasingly adopted in education and applied linguistics research to trace the intellectual evolution of emerging fields and to identify knowledge gaps that may guide future inquiry (Çiftçi et al. 2016; Zupic & Čater, 2015). In the present study, bibliometric analysis was complemented by a qualitative content analysis of the retrieved studies to provide a richer thematic characterization of the literature that quantitative co-occurrence data alone cannot yield (Krippendorff, 2004).

Search Strategy and Database Selection

The literature search was conducted across two major international academic databases, namely the Web of Science (WoS) Core Collection and Scopus, both of which are widely regarded as the most comprehensive sources for peer-reviewed scholarly output in the social sciences, education and applied linguistics (Mongeon & Paul-Hus, 2016). The decision to include both databases was deliberate, as reliance on a single database risks systematic exclusion of relevant literature indexed exclusively in the other (Martín-Martín et al., 2018).

The search was conducted in April 2026 and the following Boolean search strings were applied to titles, abstracts and keywords in both databases: *("MOOC" or "massive open online course") and ("AI literacy" or "artificial intelligence literacy" or "digital literacy") and ("multilingual" or "academic writing" or "EFL" or "second language writing" or "L2 writing")*. Searches were not restricted by document type at the initial stage, thereby permitting the retrieval of journal articles, conference papers, book chapters and reviews. However, the search was limited to publications in English.

Inclusion and Exclusion Criteria

Retrieved records were screened in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol (Page et al., 2021), which provides a transparent and reproducible framework for study selection in systematic reviews and bibliometric analyses (Tutkun & Sengul, 2025). The screening process proceeded in three successive stages: identification, screening, and eligibility assessment.

Inclusion criteria were as follows: (a) the study addressed at least one of the three focal constructs (MOOCs, AI literacy or multilingual academic writing); (b) the publication appeared in a peer-reviewed outlet or constituted a formally indexed book chapter or conference proceeding; (c) the publication date fell within the range of 2020 to 2026; and (d) the full text or sufficient metadata was accessible for analysis. Studies were excluded if they (a) did not address any of the focal constructs in a substantive manner; (b) were duplicates across databases; (c) were written in languages other than English; or (d) lacked sufficient bibliographic information for analysis. Following deduplication and successive screening of titles, abstracts, and full texts, a final corpus of 38 publications was

retained for analysis.

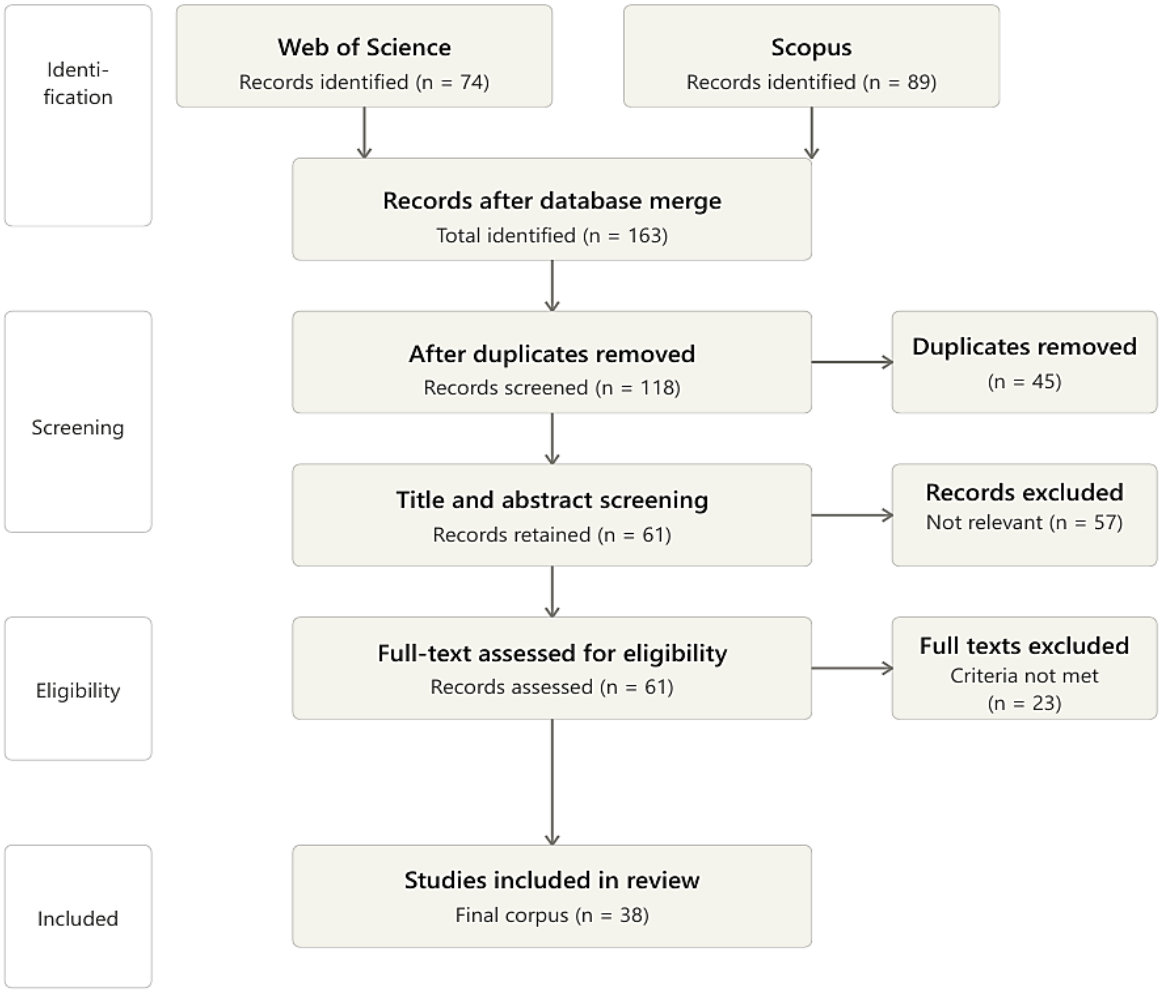

Figure 1. PRISMA Flow Diagram for Study Selection

Data Analysis

Bibliometric Analysis

Bibliometric analysis was performed using VOSviewer (version 1.6.20), a widely used software tool for constructing and visualizing bibliometric networks (van Eck & Waltman, 2010). VOSviewer was employed to generate (a) keyword co-occurrence networks, which reveal the conceptual structure of the field through the frequency and proximity of author-assigned keywords; (b) co-authorship networks, which map collaborative relationships among researchers and institutions; and (c) co-citation networks, which identify the intellectual foundations of the field by tracing which prior works are most frequently cited together. The minimum threshold for keyword inclusion in the co-occurrence analysis was set at two occurrences, while the cluster resolution parameter was established at 1.0. Network visualizations were generated using the association strength normalization method (van Eck & Waltman, 2010).

Content Analysis

To complement the bibliometric mapping with a deeper thematic characterization of the literature, a qualitative content analysis was conducted (Krippendorff, 2004). The content analysis followed an inductive-deductive hybrid approach: an initial reading of all 38 abstracts and available full texts was undertaken to identify recurring constructs, research foci, and conceptual emphases, which were subsequently organized into a hierarchical coding structure comprising themes, sub-themes and categories. Three overarching analytical frames guided the organization of findings: (a) multilingual academic writing and AI-assisted literacy tools; (b) technological, cultural, and ethical variables affecting AI adoption in scholarly writing; and (c) MOOCs, AI literacy frameworks and their pedagogical applications in multilingual language education. The coding process was iterative; categories were refined until saturation was achieved, defined here as the point at which no new substantive category emerged from additional records (Guest et al., 2006).

Findings

RQ1: Publication Trends Over Time (2020–2026)

The temporal distribution of the 38 identified publications reveals a clear and accelerating upward trend in scholarly output across the period under examination, reflecting the rapid expansion of research interest in the intersection of MOOCs, AI literacy, and multilingual academic writing following the widespread public availability of large language model-based tools from 2022 onwards. As shown in Figure 2, only a single publication was retrieved for the year 2020 (Long & Magerko, 2020), establishing the conceptual foundations of AI literacy in educational design. The corpus expanded modestly in 2021 (n = 3) and 2022 (n = 2), with foundational contributions addressing AI paradigms in education (Ouyang & Jiao, 2021), multilingual writing development (Muresan & Orna-Montesinos, 2021) and digital literacies in TESOL contexts (Prinsloo, 2022).

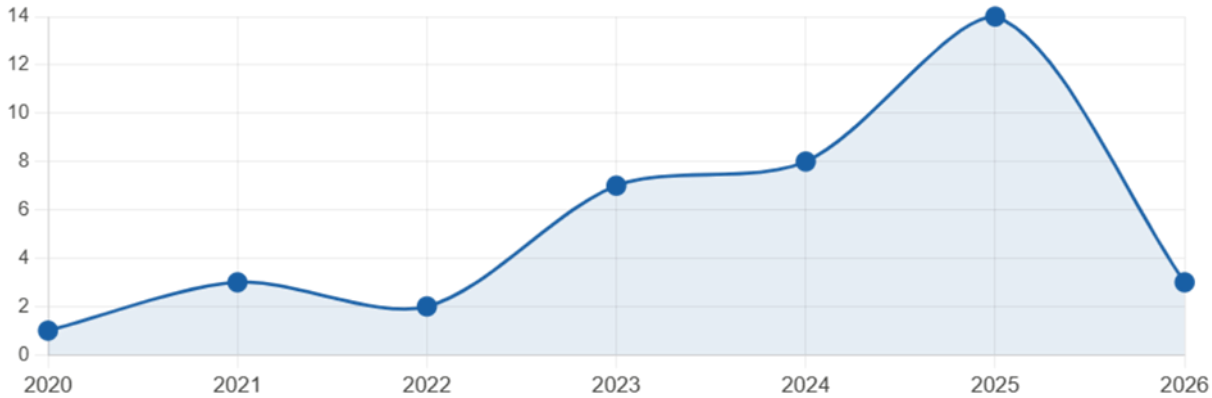

Figure 2. Publications by Year

A pronounced increase was observed from 2023 (n = 7) onwards, coinciding with the integration of ChatGPT and similar generative AI tools into academic contexts worldwide. This trajectory continued in 2024 (n = 8) and peaked in 2025 (n = 14), which alone accounts for 36.8% of the total corpus. The three publications dated 2026 represent works already available in early 2026, including preprint and conference contributions (Gazis et al.,

2026; Mavidi et al., 2026; Sanz-Tejeda et al., 2026). The overall pattern is consistent with broader trends in AI-in-education research documented in recent meta-analyses (Albedah, 2025; Yang et al., 2025).

RQ2: Country and Journal Distribution

As presented in Figure 3, China including both mainland China (n = 8) and Hong Kong (n = 4) constitutes the most represented geographical context, accounting for 31.6% of the corpus. This reflects the significant volume of EFL-focused research on AI writing tools and MOOC-based language learning conducted within Chinese higher education institutions (Rai et al., 2023; Song & Song, 2023; Teng, 2024; Wang & Wang, 2025; Yang et al., 2025). The United States (n = 4) and Spain (n = 3) rank next, followed by South Africa, Sweden, Turkey, India and Australia (n = 2 each). The remaining fourteen countries contributed single publications, attesting to the genuinely global reach of this research domain. Notably, multiple studies emerged from postcolonial or non-Anglophone contexts, including Rwanda, Kazakhstan, Iran, and Indonesia, reflecting growing scholarly attention to linguistic equity and multilingual justice in AI-mediated academic settings (Kennedy et al., 2023; Sangwa & Mutabazi, 2025; Tastanbek, 2024).

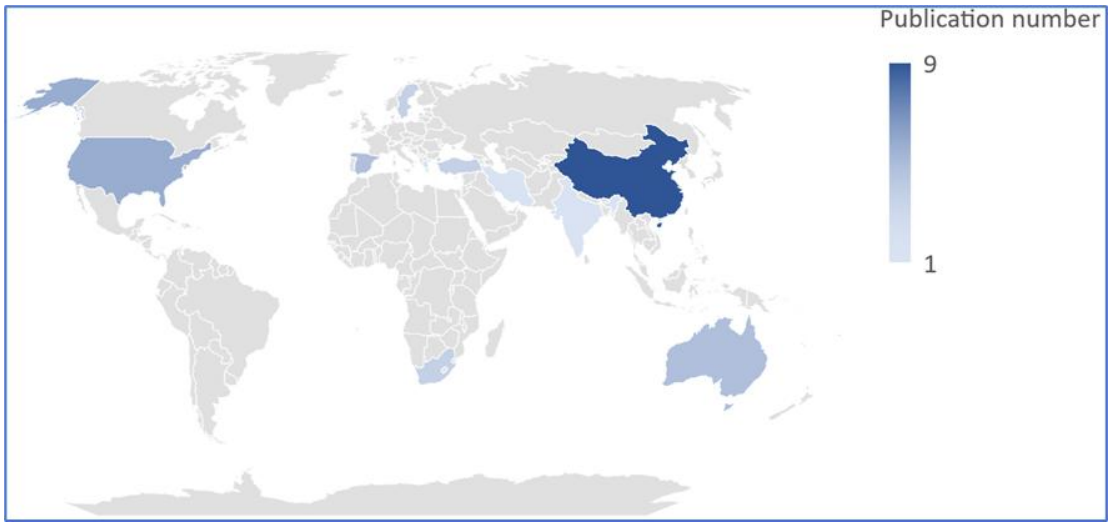

Figure 3. Geographical Distribution of Publications by Country

The geographical distribution of the 38 publications, determined on the basis of first-author institutional affiliation, reveals a broad international spread across 20 distinct countries and regions, indicating that the intersection of MOOCs, AI literacy, and multilingual academic writing is not confined to any single scholarly tradition or geopolitical context. With respect to source journals, the *Journal of Second Language Writing* was the most productive outlet, contributing five publications (13.2% of the corpus), followed by *Frontiers in Psychology* (n = 3), and *Computers and Education*: *Artificial Intelligence, Frontiers in Education,* and *Interactive Learning Environments* (n = 2 each). The remaining 26 publications were distributed across 16 different peer-reviewed journals, 6 conference proceedings, and 2 book chapters (see Table 1). The disciplinary spread spanning applied linguistics, educational technology, cognitive psychology and computer science underscores the interdisciplinary character of this field.

Table 1. Distribution of Publications by Journal and Source Type

Journal / Source	n	Field classification
Journal of Second Language Writing	5	Applied linguistics / L2 writing
Frontiers in Psychology	3	Educational psychology
Computers and Education: Artificial Intelligence	2	Educational technology / AI
Frontiers in Education	2	Education (broad)
Interactive Learning Environments	2	Educational technology
Conference proceedings (various)	6	Mixed: informatics, CALL, AI
Book chapters (various)	2	Applied linguistics / digital literacy
Other peer-reviewed journals (single publications)	16	Interdisciplinary

Conference proceedings and book chapters are grouped by category. n = number of publications per source.

RQ3: Co-Authorship, Keyword and Citation Structure

VOSviewer analysis of the keyword co-occurrence network identified four primary clusters. The first cluster, rendered in red, centred on the nodes AI literacy, dimension, writing, practice, norm, knowledge, and awareness, reflecting a body of scholarship concerned with AI literacy frameworks, academic writing conventions and the normative dimensions of digital competence in language education. This cluster aligns with foundational conceptualisations of AI literacy and their pedagogical operationalization (Long & Magerko, 2020; Ng et al., 2021; Ng et al., 2024; Kaya & Yağız, 2023).

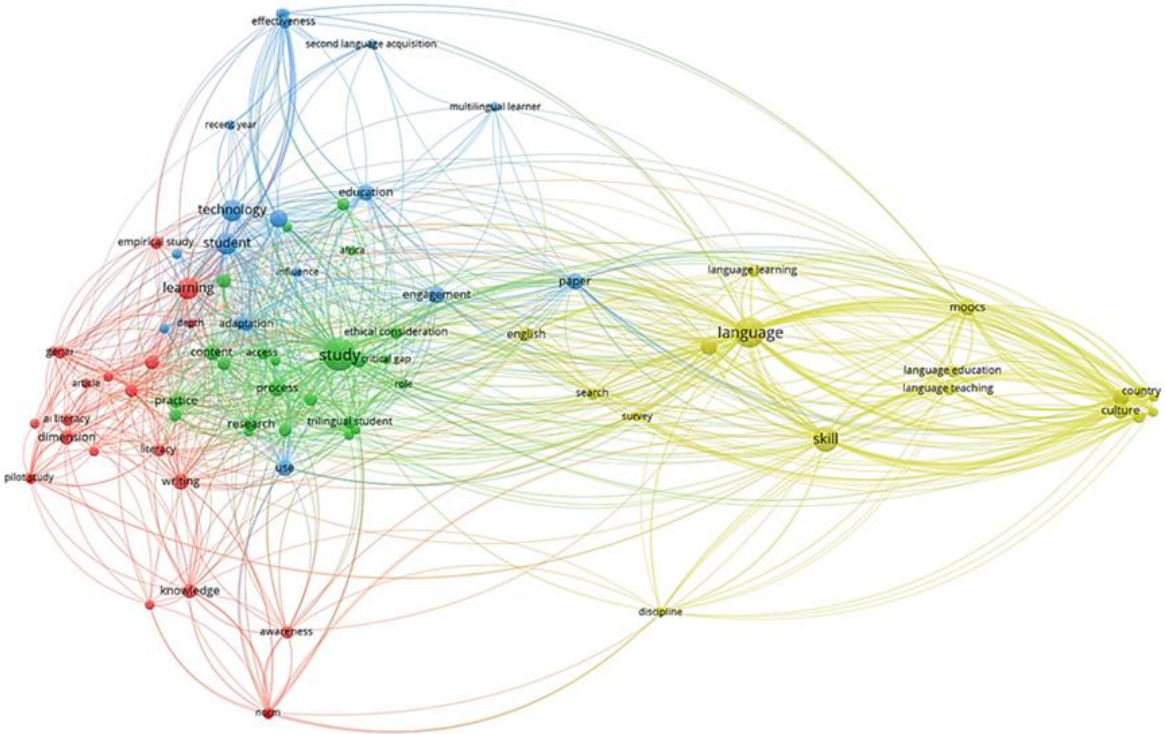

Figure 4. Keyword Co-occurrence Network

The second cluster, rendered in blue, linked effectiveness, second language acquisition, education, technology, student, multilingual learner, and empirical study, indicating a coherent body of work on technology-enhanced

language learning and the measurable outcomes of AI-assisted instruction for diverse learner populations (Song & Song, 2023; Teng, 2024; Warschauer et al., 2023; Ou et al., 2024). The third cluster, rendered in green, comprised nodes relating to ethical consideration, critical gap, trilingual student, adaptation, access, and role, reflecting applied linguistics and ethics-oriented inquiry into AI-mediated writing in multilingual and EFL contexts (Tastanbek, 2024; Olszak, 2025; Pecorari, 2023; Nosratzehi et al., 2025). The fourth cluster, rendered in yellow, foregrounded language, skill, MOOCs, language learning and teaching, country and culture, aligned with research on language MOOCs and their role in fostering linguistic competencies across diverse national and cultural settings (Luo & Wang, 2023; Uygun & Cesur, 2025; Yin & Ma, 2025; Rai et al., 2023).

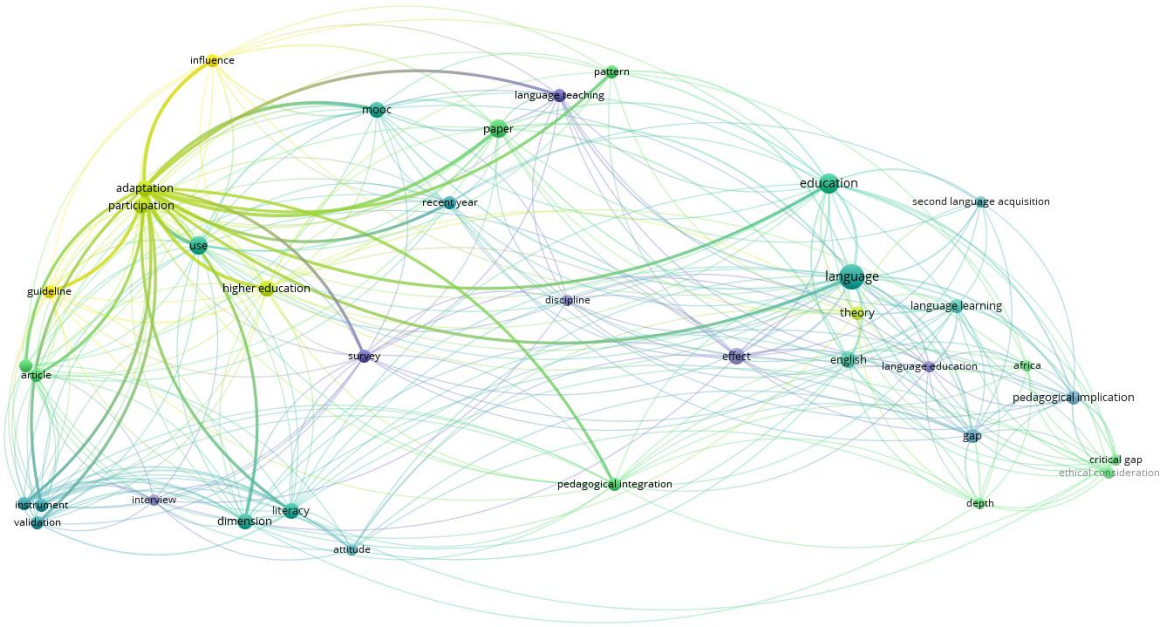

Figure 5. Abstract Words Network

The overlay visualization of the abstract words co-occurrence network presents the temporal distribution of conceptual themes derived from study abstracts across the corpus (See Figure 5). Words rendered in warmer tones including *MOOC*, *adaptation*, *participation*, *influence*, and *higher education* are associated with more recent publications, reflecting the growing scholarly attention directed at MOOC-based language instruction and learner engagement in contemporary higher education contexts (Uygun & Cesur, 2025; Yin & Ma, 2025). Abstract terms occupying the mid-spectrum, such as *language*, *education*, *English*, *literacy*, and *pedagogical integration* indicate themes with sustained conceptual prominence across multiple publication years, thereby underscoring their foundational role within the field (Tastanbek, 2024; Warschauer et al., 2023). By contrast, words rendered in cooler tones including *instrument*, *validation*, *interview*, *dimension*, and *second language acquisition* correspond to methodologically established lines of inquiry that predate the generative AI turn, suggesting that psychometric and assessment traditions formed the earlier conceptual base of the literature (Ng et al., 2021; Long & Magerko, 2020). Notably, *ethical consideration* and *critical gap* appear at the cooler periphery yet maintain connections to more recent abstract clusters, indicating that ethical discourse, though not new to the field, has been reconfigured in response to the proliferation of AI-assisted academic writing practices (Nosratzehi et al., 2025; Pecorari, 2023). Two clusters are identifiable, both anchored by the central node Ng, Davy Tsz Kit, who The co-authorship network

reveals a compact but internally coherent collaboration structure concentrated around a single research group (See Figure 6). functions as the primary bridging author across the network. The red cluster links Ng with Leung, Jac Ka Lok, Qiao, Maggie Shen, and Chu, Kai Wah Samuel, corresponding to the research team's earlier work on defining and evaluating AI literacy (Ng et al., 2021). The green cluster connects Ng with Chu, Samuel Kai Wah, Su, Jiahong, Wu, Wenjie, and Chiu, Thomas Kin Fung, reflecting the subsequent instrument development and secondary education strands of the same programme (Ng et al., 2024). The overall structure indicates that the corpus's co-authorship activity is dominated by a single, tightly knit Hong Kong-based research group with no visible inter-institutional or international co-authorship ties within the retrieved dataset, pointing to a notable concentration of AI literacy scholarship within one collaborative unit.

Figure 6. Co-authorship Network

The co-authorship network was generated via VOSviewer using author metadata extracted from the RIS corpus. Chu, Kai Wah Samuel (Ng et al., 2021) and Chu, Samuel Kai Wah (Ng et al., 2024) appear as separate nodes owing to inconsistent name formatting across source records; both entries refer to the same author. Only authors meeting the minimum co-authorship threshold were included in the visualization.

RQ3: Thematic Structure of the Literature

The content analysis of the 38 publications yielded three overarching thematic frameworks, each organized into a hierarchical structure of themes, sub-themes and descriptive categories. These frameworks are presented in Tables 2-4 and discussed in detail below.

Theme Cluster 1: Multilingual Academic Writing and AI-Assisted Literacy Tools

The thematic structure presented in Table 2 is organized around three interrelated themes that collectively examine multilingual academic writing, AI-assisted literacy practices and the institutional dimensions of AI integration in scholarly communication.

Table 2. Multilingual Academic Writing and AI-Assisted Literacy Tools

Theme	Sub-theme	Category	References
Academic Literacy Development in Multilingual Scholarly Contexts	Multilingual Writing Practices in Higher Education	Translanguaging Pedagogies as Tools for Bridging L1 Voice in Academic Writing	Tastanbek, 2024; Slamet et al., 2025; Prinsloo, 2022; Sangwa & Mutabazi, 2025; Olszak, 2025
		EFL Teachers' Academic Literacy Competencies in Multilingual Institutional Settings	Fu & Wang, 2022; Kaya & Yağız, 2023; Chang, 2024; Perifanou, 2025
		Multilingual Scholars' Genre Knowledge and Writing Conventions in Academic Discourse	Muresan & Orna-Montesinos, 2021; Fu & Wang, 2022; Tastanbek, 2024; Prinsloo, 2022
		Digital Literacy Practices and Their Intersection with Academic Writing in Plurilingual Environments	Prinsloo, 2022; Mavidi et al., 2026; Dahlström & Norberg, 2025
	AI-Assisted Academic Publishing in Multilingual Environments	AI Writing Assistance for Non-Native English Researchers in Scholarly Publication Processes	Nosratzehi et al., 2025; Kudritskaya et al., 2024; Ou et al., 2024; Chang, 2024; Warschauer et al., 2023
		AI Translation Tools and Their Effects on Multilingual Academic Publishing Equity	Amano et al., 2025; Sangwa & Mutabazi, 2025; Slamet et al., 2025; Albedah, 2025
		English-Medium AI Tools and Their Influence on Multilingualism in Academic Discourse	Amano et al., 2025; Sangwa & Mutabazi, 2025; Prinsloo, 2022; Slamet et al., 2025
Institutional Variables Shaping AI Use in Scholarly Writing	Ethical Dimensions of AI-Assisted Writing in Academic Contexts	Ethical Risks and Integrity Concerns Associated with AI Use in Academic Writing Processes	Nosratzehi et al., 2025; Pecorari, 2023; Ou et al., 2024; Kudritskaya et al., 2024; Warschauer et al., 2023
		Institutional Policy Frameworks and Governance Mechanisms for Ethical AI Writing Use	Nosratzehi et al., 2025; Baldrich et al., 2025; Sanz-Tejeda et al., 2026; Yang et al., 2025; Ng et al., 2021
		Ethical Challenges of Synthetic Media and Deepfake Technologies in MOOC-Based Learning	Gazis et al., 2026; Kennedy et al., 2023; Bedmutha, 2025; Ouyang & Jiao, 2021
	Cultural, Linguistic, Institutional	Linguistic Bias and Power Asymmetries in English-Dominant AI Writing Systems	Amano et al., 2025; Sangwa & Mutabazi, 2025; Prinsloo, 2022; Tastanbek, 2024

Theme	Sub-theme	Category	References
	Barriers to AI Adoption	Cultural and Ideological Factors Shaping Scholars' Resistance or Openness to AI Tools	Olszak, 2025; Dahlström & Norberg, 2025; Teng, 2024
		Institutional Support Strategies Addressing Researchers' Needs in AI-Integrated Writing Contexts	Kaya & Yağız, 2023; Perifanou, 2025; Ou et al., 2024;
		Environmental and Systemic Sustainability Concerns Linked to AI Use in Academic Publishing	Nosratzehi et al., 2025; Yin & Ma, 2025; Sangwa & Mutabazi, 2025

The first theme, *Academic Literacy Development in Multilingual Scholarly Contexts*, focuses on how multilingual scholars and EFL educators negotiate academic discourse conventions, genre expectations, and linguistic identity within English-dominant higher education environments (Fu & Wang, 2022; Prinsloo, 2022; Tastanbek, 2024). Studies within this cluster particularly emphasize translanguaging pedagogies, multilingual writing practices, and digital literacy as significant factors shaping academic writing development in plurilingual contexts (Slamet et al., 2025; Sangwa & Mutabazi, 2025; Dahlström & Norberg, 2025).

The second theme, *AI-Assisted Academic Publishing in Multilingual Environments*, brings together studies examining the growing use of AI-supported writing and translation tools in scholarly publication processes. Research highlights both the opportunities these technologies provide for non-native English-speaking researchers and the inequalities they may reproduce through English-dominant AI infrastructures (Warschauer et al., 2023; Kudritskaya et al., 2024; Amano et al., 2025). The literature also discusses how AI tools influence multilingualism, publication accessibility and academic discourse practices in global scholarly communication (Prinsloo, 2022; Slamet et al., 2025).

The final theme, *Institutional Variables Shaping AI Use in Scholarly Writing*, addresses the ethical, cultural and institutional dimensions of AI integration in academic contexts. Studies in this cluster focus on academic integrity concerns, institutional governance frameworks, linguistic bias in AI systems, and scholars' varying attitudes toward AI adoption (Pecorari, 2023; Baldrich et al., 2025; Teng, 2024). In addition, the literature highlights the importance of institutional support mechanisms and sustainability considerations in ensuring responsible and equitable AI use in scholarly writing practices (Kaya & Yağız, 2023; Yin & Ma, 2025).

Theme Cluster 2: Technological Variables and Institutional Recommendations for AI Adoption in Scholarly Writing

The thematic structure presented in Table 2 is organized around two major themes focusing on the technological and institutional dimensions of AI integration in academic writing.

Table 2. Technological Variables and Institutional Recommendations for AI Adoption in Scholarly Writing

Theme	Sub-theme	Category	References
Technological Dimensions of AI Tool Integration in Academic Writing Contexts	Beneficial AI Tools Supporting Academic Writing Practices	Generative AI Tools' Effects on Multilingual Learners' Academic Language Skills	Song & Song, 2023; Teng, 2024; Warschauer et al., 2023; Baldrich et al., 2025; Kudritskaya et al., 2024; Wang & Wang, 2025
		AI-Powered Feedback Tools and their Role in Improving Writing Revision Processes	Song & Song, 2023; Zhang, 2024; Teng, 2024; Yang et al., 2025.
		Adaptive AI Tutoring Systems and their Pedagogical Effects on Language Skill Development	Bedmutha, 2025; Kennedy et al., 2023; Gazis et al., 2026
		AI Translation and Multilingual Processing Tools Facilitating Access to Academic Content	Amano et al., 2025; Kennedy et al., 2023; Slamet et al., 2025
	Technological Barriers and Adoption Challenges in AI-Assisted Writing	Technical Limitations and Reliability Issues of AI Writing Tools in Scholarly Contexts	Warschauer et al., 2023; Pecorari, 2023; Sanz-Tejeda et al., 2026; Nosratzehi et al., 2025
		Digital Divide and Unequal Access to AI Tools among Multilingual Scholarly Communities	Sangwa & Mutabazi, 2025; Amano et al., 2025; Prinsloo, 2022; Mavidi et al., 2026
		Over-Reliance on AI Tools and Its Implications for Developing Autonomous Writing Competencies	Teng, 2024; Ou et al., 2024; Pecorari, 2023; Olszak, 2025
Institutional Recommendations and Guidelines for Ethical AI Use in Academic Contexts	Policy and Governance Frameworks for AI in Academic Writing	Institutional Policies Governing AI Use in Research Writing and Peer Review Processes	Nosratzehi et al., 2025; Baldrich et al., 2025; Sanz-Tejeda et al., 2026; Yang et al., 2025; Kudritskaya et al., 2024
		Actionable Recommendations for Ethical AI Integration in Academic Writing Instruction	Nosratzehi et al., 2025; Ou et al., 2024; Long & Magerko, 2020; Ng et al., 2021
		Guidelines for MOOC Content Development Addressing Ethical Considerations in AI-Assisted Learning	Gazis et al., 2026; Perifanou, 2025; Yin & Ma, 2025; Uygun & Cesur, 2025; Kennedy et al., 2023
		Support Strategies Addressing Researchers' Needs in AI-Integrated Scholarly Writing Workflows	Kaya & Yağız, 2023; Perifanou, 2025; Chang, 2024; Ou et al., 2024; Nosratzehi et al., 2025
	Pedagogical Implications for AI-Literate Language	Curriculum Design Principles Integrating AI Literacy Competencies into Language Teacher Education	Long & Magerko, 2020; Ng et al., 2021; Ouyang & Jiao, 2021; Perifanou, 2025; Bedmutha, 2025

Theme	Sub-theme	Category	References
	Teaching Practice	Professional Development Programmes Preparing Language Teachers for AI-Enhanced Instruction	Kaya & Yağız, 2023; Fu & Wang, 2022; Perifanou, 2025; Chang, 2024; Zhang, 2024
		Learner-Centred AI Design Principles for Supporting Multilingual Academic Writing Development	Bedmutha, 2025; Long & Magerko, 2020; Ng et al., 2024

The first theme, *Technological Dimensions of AI Tool Integration in Academic Writing Contexts*, examines the benefits and challenges of AI-supported writing technologies in multilingual academic environments. Studies highlight the positive contributions of generative AI tools, automated feedback systems, adaptive tutoring technologies, and AI translation tools in improving academic language skills, writing revision, and access to scholarly content (Song & Song, 2023; Teng, 2024; Warschauer et al., 2023; Amano et al., 2025). At the same time, the literature identifies challenges such as technical limitations, unequal access to AI technologies, and concerns regarding over-reliance on AI in academic writing processes (Pecorari, 2023; Sangwa & Mutabazi, 2025; Olszak, 2025).

The second theme, *Institutional Recommendations and Guidelines for Ethical AI Use in Academic Contexts*, focuses on governance frameworks, ethical AI integration, and pedagogical implications for language education. Research emphasizes the importance of institutional policies, AI literacy frameworks, professional development programmes, and learner-centred instructional models designed to support responsible and sustainable AI use in multilingual academic writing contexts (Nosratzehi et al., 2025; Ng et al., 2021; Perifanou, 2025; Kaya & Yağız, 2023).

Theme Cluster 3: MOOCs, AI Literacy, and AI Tools in Multilingual Language Education

The thematic structure presented in Table 3 is organized around two major themes examining the role of MOOCs, AI literacy, and AI-supported technologies in multilingual academic writing and language learning contexts.

Table 3. MOOCs, AI Literacy and AI Tools Supporting Multilingual Academic Writing

Theme	Sub-theme	Category	References
MOOC Design and Delivery for Multilingual Language Learners	MOOC Content Design for Multilingual and Intercultural Contexts	Intercultural Competence Integration in Language MOOC Curriculum Design	Rai et al., 2023; Uygun & Cesur, 2025; Perifanou, 2025; Mavidi et al., 2026; Uygun & Cesur, 2025
		Open Educational Resources as Foundations for Sustainable MOOC-Based Language Teaching	Perifanou, 2025; Yin & Ma, 2025; Rai et al., 2023
		AI-Powered Content Personalization Strategies	Bedmutha, 2025; Kennedy et

Theme	Sub-theme	Category	References
		in Multilingual MOOC Environments	al., 2023; Gazis et al., 2026
		Sustainable Development Perspectives on Language MOOC Growth and Evolution	Yin & Ma, 2025; Perifanou, 2025; Rai et al., 2023
	Learner Engagement and Motivation in Language MOOCs	Emotional Factors Influencing Learner Engagement and Persistence in Language MOOCs	Luo & Wang, 2023; Uygun & Cesur, 2025; Yin & Ma, 2025; Rai et al., 2023
		Self-Regulated Learning Strategies and Autonomy Development in Online Language Courses	Luo & Wang, 2023; Zhang, 2024; Uygun & Cesur, 2025; Perifanou, 2025
		AI Integration in Flipped Classroom MOOC Models for EFL Writing Skill Development	Zhang, 2024; Uygun & Cesur, 2025; Kennedy et al., 2023; Ouyang & Jiao, 2021
		Learner Satisfaction and Perceived Effectiveness in Technology-Enhanced Language Learning	Luo & Wang, 2023; Uygun & Cesur, 2025

The first theme, MOOC Design and Delivery for Multilingual Language Learners, focuses on the development of multilingual and intercultural MOOC environments. Studies within this cluster emphasize intercultural competence integration, open educational resources, AI-powered content personalization, and sustainability-oriented approaches in language MOOC design (Rai et al., 2023; Perifanou, 2025; Bedmutha, 2025; Yin & Ma, 2025). The literature highlights the growing importance of adaptive and inclusive MOOC structures that support multilingual learners in digitally mediated educational settings.

The second theme, Learner Engagement and Motivation in Language MOOCs, addresses the psychological, pedagogical, and technological factors shaping learner participation in online language learning environments. Research highlights the role of emotional engagement, self-regulated learning strategies, learner autonomy, and flipped classroom models supported by AI technologies in enhancing EFL writing development and learner satisfaction (Luo & Wang, 2023; Zhang, 2024; Uygun & Cesur, 2025; Ouyang & Jiao, 2021). Overall, the literature suggests that AI-enhanced MOOC environments contribute to more flexible, learner-centred, and interactive multilingual language learning experiences.

Discussion and Conclusion

This study aims to map the thematic, structural, and content patterns of scientific publications produced at the intersection of MOOCs, AI literacy, and multilingual academic writing between 2020 and 2026 from a bibliometric perspective. The distribution of publications by year, their geographical and institutional sources, keyword co-occurrence networks, author collaboration structures and content analysis findings are considered holistically within the scope of the research. The findings indicate the emergence of a unique field structure interconnected along the axes of multilingual academic writing, AI-powered literacy tools, technological and

ethical dimensions and MOOC design.

The findings reveal that the volume of publications at the intersection of MOOCs, AI literacy, and multilingual academic writing exhibits a significant and accelerating upward trend during the 2020-2026 period. This increase becomes particularly pronounced from 2023 onwards, reaching a level where it alone constitutes approximately one-third of the total corpus by 2025. It is noteworthy that this trend coincides with the global proliferation of generative AI tools based on large language models. This demonstrates that the research agenda is being shaped in a way that is sensitive to technological developments, and that the implications of AI in education are rapidly becoming an institutional research topic. Indeed, this pattern aligns with the general increase in publications observed in AI-assisted education research in recent years (Albedah, 2025; Yang et al., 2025). Furthermore, publications from 2020 and 2021 appear to have served as a conceptual foundation in the literature. Long and Magerko's (2020) work defining the components of AI literacy and Ouyang and Jiao's (2021) work framing AI paradigms in education belong to this early period. In this context, it is considered that the growth in publication volume reflects not only a quantitative increase but also the conceptual maturation in the literature and the deepening of interdisciplinary interest.

Geographic distribution findings indicate that this research area is not limited to specific scientific traditions or geographical regions, rather it exhibits a broad international reach. However, it is noteworthy that publications from China-based institutions carry a significant weight. This is thought to be directly related to the accumulating institutional capacity of academic writing research focused on LDL (Learning, Development, and Interaction) and MOOC-based language learning studies in Chinese higher education (Rai et al., 2023; Yang et al., 2025). The presence of studies from countries such as Rwanda, Kazakhstan, and Indonesia points to a growing awareness of multicultural representation in the literature (Kennedy et al., 2023; Sangwa & Mutabazi, 2025). An examination of source journals reveals that journals such as the Journal of Second Language Writing and Frontiers in Psychology stand out; however, publications are spread across diverse disciplines such as applied linguistics, educational technology, cognitive psychology and computer science. This confirms the multidisciplinary nature of the field and highlights the need to strengthen interdisciplinary communication channels.

Keyword co-occurrence network findings reveal that the research field is organized around four core conceptual clusters: AI literacy frameworks and academic writing norms, technology-assisted language learning and student outcomes, ethical concerns and critical gaps, language MOOCs and cultural context. The fact that these clusters are both thematically distinct and intersect at certain interface points indicates that the field has the potential for conceptual integration, but that this integration is not yet complete. Research interest in topics such as time-lapse visualization, AI-driven content personalization, student engagement on MOOC platforms, and adaptation processes in the context of higher education has become prominent recently. However, methodological traditions focused on validation, measurement and second language acquisition belong to earlier periods. An examination of the authorship network reveals that a single Hong Kong-based research group dominates authorship activity, international collaboration patterns beyond this group remain quite limited. This finding is consistent with the conceptual foundations established in the work of Long and Magerko (2020) and Ng et al. (2021; 2024), but highlights the need to develop broad-scale interdisciplinary collaboration.

Content analysis findings reveal that the literature is structured around three interconnected thematic frameworks. The first framework addresses the intersection of multilingual academic writing practices with AI-powered tools within the context of translinguistic pedagogies, author identity, and institutional language policies (Tastanbek, 2024; Canagarajah, 2024; Warschauer et al., 2023). Research in this area highlights how English-dominant AI infrastructures can reproduce linguistic inequalities in multicultural academic writing environments, thus drawing attention to the tension between technological accessibility and linguistic justice (Amano et al., 2025; Sangwa & Mutabazi, 2025). The second thematic framework focuses on the technological and institutional variables shaping the integration of AI tools into academic writing contexts. In addition to studies documenting the potential of generative AI to improve language skills, concerns about over-reliance, technical reliability issues, and academic integrity are also addressed within this framework (Pecorari, 2023; Teng, 2024; Nosratzehi et al., 2025). The third framework examines the pedagogical implications of MOOC design and AI literacy frameworks in multilingual language education. Emotional engagement, self-regulated learning, and flipped classroom models emerge as key variables in this context (Luo & Wang, 2023; Zhang, 2024; Uygun & Cesur, 2025). This thematic structure suggests that the literature is becoming increasingly holistic and intersectional, however, full integration of the three areas has not yet been achieved.

The findings of this study offer both theoretical contributions to the literature and practical implications. From a theoretical perspective, the research demonstrates that seemingly separate research areas such as MOOCs, AI literacy, and multilingual academic writing are actually deeply conceptually interconnected. Mapping these three areas together reveals analytical value in terms of highlighting points of interdisciplinary synergy. Indeed, research that conceptualizes AI literacy not merely as a technical competence but as a holistic competence framework with critical, ethical, and social dimensions (Kong et al., 2025; Stolpe & Hallström, 2024) provides a theoretical foundation that aligns with the findings of this study.

In terms of practical implications, the findings offer important guidance, particularly for educators and program developers working in multicultural and non-English language contexts. Designing MOOCs in a way that is sensitive to the linguistic and cultural identities of multilingual learners, addressing the ethical dimensions of integrating AI tools into pedagogical processes and including AI literacy components in teacher training programs are among the priority practical requirements indicated in the literature (Kelley & Wenzel, 2025; Perifanou, 2025; Ng et al., 2021). Furthermore, the findings provide policymakers with an evidence-based reference point for designing governance frameworks for AI-powered academic writing tools and strengthening institutional support mechanisms.

Limitations and Recommendations

Several methodological limitations must be considered when evaluating the literature review and generalizations of this study. First, limiting the data source to only the Web of Science and Scopus databases excludes studies accessible on different indexing platforms or published in languages other than English, reflecting the true breadth and geographical diversity of the literature in a narrow way. Furthermore, since the citation impact levels of studies

published in the last two years are not yet mature, evaluations based on the citation structure of this period exhibit a structural maturation delay. The researcher-interpretive nature of the content analysis indicates that a certain degree of subjectivity is inevitable in the code-building process. The lack of inter-author reliability assessment reinforces this limitation. The focus on only English publications and the exclusion of other languages is a point to consider for interpretation. Finally, the relatively limited final corpus of 38 publications restricts the depth and representativeness of the co-authorship network analysis in particular.

Future researchers should prioritize search strategies encompassing broader database pools and non-English publication sources, as this is critical to more accurately reflecting the true linguistic and geographical diversity of the field. Given the geographical concentration trend revealed in this study's author network analysis, encouraging international collaboration among researchers from different regions can yield valuable results at both academic and practical levels. The need for longitudinal and context-sensitive studies examining the unique impacts of generative AI tools on multilingual academic writing processes is also among the priority research gaps identified in the literature. Furthermore, studies addressing the integrated relationship between MOOC design, AI literacy and multilingual pedagogy at a theoretical level can make significant contributions to the conceptual articulation of these three areas. Finally, the inclusion of qualitative research focusing on translinguistic practices and student autonomy in digital environments is of great value in developing a deeper understanding that purely bibliometric analyses cannot provide.

Conclusion

This study is one of the first to systematically map the bibliometric structure of MOOCs, AI literacy, and multilingual academic writing fields between 2020 and 2026. The research confirms that a comprehensive bibliometric synthesis addressing these three fields together has not been previously undertaken in the literature, thus, it offers an original academic contribution to filling this gap. The findings demonstrate that the field has a rapidly evolving literature in terms of content, structure, and time, but has not yet fully realized its significant potential in terms of conceptual integration and interdisciplinary collaboration.

In particular, the study draws attention to the linguistic inequalities reproduced by English-dominant AI infrastructures in multicultural contexts, offering an evidence-based framework for both technological and pedagogical policy development processes. This methodological choice, integrating bibliometric methods with content analysis, represents an innovative contribution specific to the field. Situated at the intersection of educational sciences, Applied Linguistics and science of science, this study provides a solid reference foundation for future research to further deepen the conceptual and empirical aspects of this research agenda.

Statements and Declarations

Acknowledgments/Notes: Not applicable

During the preparation of this article, the authors did not use ChatGPT.

Supplementary Materials: Not applicable

Author Contributions: All authors contributed equally. All authors have read and agreed to the published version of the manuscript.

Funding: This research has been funded by the Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan IRN AP27511501 “Improving Scholarly writing in Language Education: Critical Literacy Related to AI- Assisted Academic Publishing in Kazakhstan”.

Data Availability: Not applicable.

Ethics Approval: The study was performed in accordance with the study protocol and ethical guidelines and regulations.

Informed Consent: Informed consent was obtained from all participants involved in the study.

Conflicts of Interest: The authors declare no conflicts of interest.

References

* *Studies included in the analysis*

* Albedah, F. (2025). Artificial intelligence in language education: A systematic review of multilingual applications, large language models, and emerging challenges. *Language Teaching Research Quarterly, 49*, 247. https://doi.org/10.32038/ltrq.2025.49.13

Almashour, M., Aldamen, H. A. K., & Jarrah, M. (2025). Algorithmic feedback and multilingual identity: Translanguaging practices in Jordanian EFL academic writing. *Social Sciences & Humanities Open, 12,* 102016. https://doi.org/10.1016/j.ssaho.2025.102016

* Amano, T., Bowker, L., & Burton-Jones, A. (2025). AI-mediated translation presents two possible futures for academic publishing in a multilingual world. *PLOS Biology, 23*(6), e3003215. https://doi.org/10.1371/journal.pbio.3003215

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics, 11(*4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

* Baldrich, K., Pérez-García, C., & Santamarina-Sancho, M. (2025). Artificial intelligence in academic literacy: Empirical evidence on reading and writing practices in higher education. *Frontiers in Education, 10,* 1701238. https://doi.org/10.3389/feduc.2025.1701238

* Bedmutha, A. S. (2025). Designing adaptive, multilingual AI tutors for universal AI literacy: A framework for inclusive and ethical AI education. *Journal of Computational Analysis and Applications, 34*(12). https://doi.org/10.48047/jocaaa.2025.34.12.33

Bloch, J. (2018). Digital Storytelling in the Multilingual Academic Writing Classroom: Expanding the

Possibilities. *Dialogues: An Interdisciplinary Journal of English Language Teaching and Research, 2*(1). https://doi.org/10.30617/dialogues.2.1.6

Canagarajah, S. (2024). Decolonizing Academic Writing Pedagogies for Multilingual Students. *TESOL Quarterly, 58*(1), 280–306. https://doi.org/10.1002/tesq.3231

* Chang, C. (2024). Enhancing EFL university students' readiness for learning academic content in English: The effectiveness of combining MOOCs with data-driven learning activities in an English language classroom. *English Teaching & Learning, 48*(3), 439–462. https://doi.org/10.1007/s42321-023-00139-8

Çiftçi, Ş. K., Danişman, Ş., Yalçın, M., Tosuntaş, Ş. B., Ay, Y., Sölpük, N., & Karadağ, E. (2016). Map of scientific publication in the field of educational sciences and teacher education in Turkey: A bibliometric study. *Educational Sciences: Theory & Practice, 16*, 1097-1123. https://doi.org/10.12738/estp.2016.4.0009

* Dahlström, H., & Norberg, M. (2025). Perceptions of AI in higher education: Affordances and risks for students with Swedish as a second language in developing academic literacy. *In 19th International Technology, Education and Development Conference (INTED 2025)* (pp. 2991–2999). IATED. https://doi.org/10.21125/inted.2025.0788

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research, 133*, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070

* Fu, J., & Wang, Y. (2022). Inspecting EFL teachers' academic literacy development in multilingual contexts: A global vision. *Heliyon, 8*(12), e12143. https://doi.org/10.1016/j.heliyon.2022.e12143

Gad-el-Hak, M. (2015). To MOOC, or Not to MOOC, That is the Question. Mechanical Engineering, 137(09), 46–47. https://doi.org/10.1115/1.2015-Sep-4

* Gazis, A., Chamalidou, E., Ntaoulas, N., & Vavouras, T. (2026). Synthetic media in multilingual MOOCs: Deepfake tutors, pedagogical effects, and ethical-policy challenges. *arXiv preprint*. https://doi.org/10.48550/ARXIV.2602.18457

Gonon, I. (2015). La révolution MOOC. *Administration & Éducation, 146*(2), 103–108. https://doi.org/10.3917/admed.146.0103

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18*(1), 59–82. https://doi.org/10.1177/1525822X05279903

Jiang, L., & Luo, Y. (2019). Teaching writing for academic purposes to multilingual students: Instructional approaches. *Language and Education, 33*(2), 178–181. https://doi.org/10.1080/09500782.2018.1479420

Kaufhold, K., & Yencken, D. E. (2021). Academic writing centres in multilingual settings: Intermediary agents of higher education language policy? *Linguistics and Education, 64,* 100950. https://doi.org/10.1016/j.linged.2021.100950

* Kaya, F., & Yağız, O. (2023). Developing and evaluating an online professional development model on academic writing conventions and norms in English. *Sage Open, 13*(4). https://doi.org/10.1177/21582440231212786

Kelley, M., & Wenzel, T. (2025). Advancing Artificial Intelligence Literacy in Teacher Education Through Professional Partnership Inquiry. *Education Sciences, 15*(6), 659. https://doi.org/10.3390/educsci15060659

* Kennedy, D., Halim, E., Condrobimo, A. R., Syamsuar, D., & Ferdianto, F. (2023). Overcoming language barriers in MOOCs with artificial intelligence: An AI-based approach for multilingual education. *In 2023 Eighth International Conference on Informatics and Computing (ICIC)* (pp. 1–6). IEEE. https://doi.org/10.1109/ICIC60109.2023.10381900

Kim, S., & Kim, S. (2016). A Case Study of Developing Korean Language Education Model in MOOC: Global MOOC and K-MOOC. *Teaching Korean as a Foreign Language, 44*, 85–129. https://doi.org/10.21716/TKFL.44.4

Kong, S.-C., Korte, S.-M., Burton, S., Keskitalo, P., Turunen, T., Smith, D., Wang, L., Lee, J. C.-K., & Beaton, M. C. (2025). Artificial Intelligence (AI) literacy – an argument for AI literacy in education. *Innovations in Education and Teaching International, 62*(2), 477–483. https://doi.org/10.1080/14703297.2024.2332744

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Sage.

Krumsvik, R. J. (2024). Artificial Intelligence, Education and the Professional Perspective. *Nordic Journal of Digital Literacy, 19*(2), 55–63. https://doi.org/10.18261/njdl.19.2.1

* Kudritskaya, M., Plastinina, N., Kushnina, L., Plekhanova, Y., Matytcina, M., & Stepanova, M. (2024). Balancing innovation with ethics: AI applications for enhancing language competence in academic writing and reading. *In 2024 4th International Conference on Technology Enhanced Learning in Higher Education (TELE)* (pp. 380–385). IEEE. https://doi.org/10.1109/TELE62556.2024.10605668

* Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. *In CHI '20: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1–16). ACM. https://doi.org/10.1145/3313831.3376727

* Luo, R., & Wang, Y. (2023). Enjoyment, boredom, and perceived effectiveness of learners in language MOOCs: The mediating effect of self-regulated learning. *Frontiers in Psychology, 14*, 1145773. https://doi.org/10.3389/fpsyg.2023.1145773

Martín-Martín, A., Orduna-Malea, E., Thelwall, M., & Delgado López-Cózar, E. (2018). Google Scholar, Web of Science, and Scopus: A systematic comparison of citations in 252 subject categories. *Journal of Informetrics, 12*(4), 1160–1177. https://doi.org/10.1016/j.joi.2018.09.002

* Mavidi, P. N., Korada, A. R., Vutukuri, K., Kanta, P., Balan, B. V., & Modalavalasa, K. P. (2026). *Navigating English learning: Digital solutions for multilingual learners. In Building digital literacy in early childhood education* (pp. 223–240). IGI Global. https://doi.org/10.4018/979-8-3373-6269-4.ch009

McCarville, M. (2026). Supporting neurodivergent multilingual learners with academic writing. *The Curriculum Journal, 37*(2), 554–557. https://doi.org/10.1002/curj.70023

Mongeon, P., & Paul-Hus, A. (2016). The journal coverage of Web of Science and Scopus: A comparative analysis. *Scientometrics, 106*(1), 213–228. https://doi.org/10.1007/s11192-015-1765-5

* Muresan, L.-M., & Orna-Montesinos, C. (2021). *Academic literacy development: What does it entail for multilingual scholars? In Academic literacy development* (pp. 1–22). Springer. https://doi.org/10.1007/978-3-030-62877-2_1

Naidu, S. (2020). The MOOC is dead—Long live MOOC 2.0! *Distance Education, 41*(1), 1–5. https://doi.org/10.1080/01587919.2020.1727289

* Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). AI literacy: Definition, teaching, evaluation

and ethical issues. *Proceedings of the Association for Information Science and Technology, 58*(1), 504–509. https://doi.org/10.1002/pra2.487

* Ng, D. T. K., Su, J., Leung, J. K. L., & Chu, S. K. W. (2024). Artificial intelligence (AI) literacy education in secondary schools: A review. *Interactive Learning Environments, 32(*10), 6204–6224. https://doi.org/10.1080/10494820.2023.2255228

* Ng, D. T. K., Wu, W., Leung, J. K. L., Chiu, T. K. F., & Chu, S. K. W. (2024). Design and validation of the AI literacy questionnaire: The affective, behavioural, cognitive and ethical approach. *British Journal of Educational Technology, 55*(3), 1082–1104. https://doi.org/10.1111/bjet.13411

* Nosratzehi, M., Nosratzehi, S., & Keikha, M. (2025). Beyond recommendations: Expanding the ethical discourse on AI-assisted academic writing. *Advances in Simulation, 10*(1), 31. https://doi.org/10.1186/s41077-025-00362-2

* Olszak, I. (2025). Artificial intelligence and the transformation of literacy: Trilingual students' perspectives on AI-supported writing development. *European Journal of Applied Linguistics Studies, 8*(4). https://doi.org/10.46827/ejals.v8i4.664

* Ou, A. W., Khuder, B., Franzetti, S., & Negretti, R. (2024). Conceptualising and cultivating critical GAI literacy in doctoral academic writing. *Journal of Second Language Writing, 66*, 101156. https://doi.org/10.1016/j.jslw.2024.101156

* Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. *Computers and Education: Artificial Intelligence, 2,* 100020. https://doi.org/10.1016/j.caeai.2021.100020

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372,* n71. https://doi.org/10.1136/bmj.n71

* Pecorari, D. (2023). Generative AI: Same same but different? *Journal of Second Language Writing, 62*, 101067. https://doi.org/10.1016/j.jslw.2023.101067

* Perifanou, M. (2025). *Sustaining openness in language teacher education: Insights from a MOOC-based language OER training program and the emerging role of AI. In EuroCALL 2025: Advancing CALL:* New research agendas. https://doi.org/10.4995/EuroCALL2025.2025.21288

* Prinsloo, M. (2022). Commentary: Critical digital literacies, practices and contexts. *TESOL Quarterly, 56*(3), 1068–1077. https://doi.org/10.1002/tesq.3152

Pursel, B. K., Zhang, L., Jablokow, K. W., Choi, G. W., & Velegol, D. (2016). Understanding MOOC students: Motivations and behaviours indicative of MOOC completion. *Journal of Computer Assisted Learning, 32(*3), 202–217. https://doi.org/10.1111/jcal.12131

Rachbauer, T., Graup, J., & Rutter, E. (2025). Digital literacy and artificial intelligence literacy in teacher training. *Forum for Education Studies, 3*(1), 1842. https://doi.org/10.59400/fes1842

* Rai, L., Deng, C., Lin, S., & Fan, L. (2023). Massive open online courses and intercultural competence: Analysis of courses fostering soft skills through language learning. *Frontiers in Psychology, 14*, 1219478. https://doi.org/10.3389/fpsyg.2023.1219478

Reich, J. (2015). Rebooting MOOC Research. *Science, 347*(6217), 34–35.

https://doi.org/10.1126/science.1261627

Reich, J., & Ruipérez-Valiente, J. A. (2019). The MOOC pivot. S*cience, 363*(6423), 130–131. https://doi.org/10.1126/science.aav7958

Saadatdoost, R., Jafarkarimi, H., Sim, A. T. H., & Hee, J. M. (2019). Understanding MOOC Learners: Insights from Participation in Coursera MOOC. *International Journal of Web-Based Learning and Teaching Technologies, 14*(1), 93–112. https://doi.org/10.4018/IJWLTT.2019010107

* Sangwa, S., & Mutabazi, P. (2025). AI-powered multilingual degrees in higher education: Postcolonial insights on linguistic justice and disruptive innovation. *Open Journal of AI, Ethics & Society, 1*(1). https://doi.org/10.65655/9ahzce09

* Sanz-Tejeda, A., Domínguez-Oller, J. C., Baldaquí-Escandell, J. M., Gómez-Díaz, R., & García-Rodríguez, A. (2026). The impact of generative AI on academic reading and writing: A synthesis of recent evidence (2023–2025). *Frontiers in Education, 10,* 1711718. https://doi.org/10.3389/feduc.2025.1711718

Şerban-Oprescu, A.-T. (2021). Academic literacy development. Perspectives on multilingual scholars' approaches to writing. *SYNERGY, 17*(2). https://doi.org/10.24818/SYN/2021/17/2.10

Shah, J., & Khanna, M. (2022). What Determines MOOC Success? Validation of MOOC Satisfaction Continuance Model. Vision: *The Journal of Business Perspective*, 09722629221131386. https://doi.org/10.1177/09722629221131386

Simonson, M. (2015). MOOC Madness. *Distance Learning, 12*(1), 35–36. https://doi.org/10.1108/DL-02-2015-0017

* Slamet, M., Gannaway, J., & Choi, J. (2025). 'It is AI-translated but not entirely…': Beyond-the-human meshwork in multilingual academic literacy practices. *International Journal of Bilingual Education and Bilingualism*. Advance online publication. https://doi.org/10.1080/13670050.2025.2576062

Ślósarz, A. (2025). Designing MOOC User Activity. *International Journal of Research in E-Learning, 1*–31. https://doi.org/10.31261/IJREL.2025.11.1.03

Solli, K., & Ødemark, I. L. (2019). Multilingual Research Writing beyond English: The Case of Norwegian Academic Discourse in an Era of Multilingual Publication Practices. *Publications, 7*(2), 25. https://doi.org/10.3390/publications7020025

* Song, C., & Song, Y. (2023). Enhancing academic writing skills and motivation: Assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. *Frontiers in Psychology, 14*, 1260843. https://doi.org/10.3389/fpsyg.2023.1260843

Spoerhase, C. (2015). Seminar versus MOOC. *New Left Review, 2(*96), 77–82. https://doi.org/10.64590/t7t

Stolpe, K., & Hallström, J. (2024). Artificial intelligence literacy for technology education. *Computers and Education Open, 6*, 100159. https://doi.org/10.1016/j.caeo.2024.100159

* Tastanbek, S. (2024). Translanguaging pedagogy in EAP writing: A multilingual Qazaq instructor's perspective. *Journal of Second Language Writing, 63,* 101075. https://doi.org/10.1016/j.jslw.2023.101075

Tay, A., & Musib, M. K. (2017). To MOOC or Not To MOOC: A Review of Strategies to Manage High Attrition in MOOC Participation. *Asian Journal of the Scholarship of Teaching and Learning, 7*(1), 67–82. https://doi.org/10.24112/ajsotl.73078

* Teng, M. F. (2024). "ChatGPT is the companion, not enemies": EFL learners' perceptions and experiences in using ChatGPT for feedback in writing. *Computers and Education: Artificial Intelligence, 7,* 100270.

https://doi.org/10.1016/j.caeai.2024.100270

Tutkun, N., & Sengul, S. (2025). Meta-Analysis of Studies on Number Sense Skills in Preschool: The Case of Turkey. *Anatolian Turkish Journal of Education, 7*(1), 143-157. https://doi.org/10.29329/ated.2025.1319.9

* Uygun, E., & Cesur, K. (2025). Teaching English for general purposes through a MOOC in higher education: A quasi-experimental study to explore its effects on learner achievement and satisfaction. *Education and Information Technologies, 30*(3), 3389–3415. https://doi.org/10.1007/s10639-024-12948-w

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics, 84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

* Wang, C., & Wang, Z. (2025). Investigating L2 writers' critical AI literacy in AI-assisted writing: An APSE model. *Journal of Second Language Writing, 67,* 101187. https://doi.org/10.1016/j.jslw.2025.101187

* Warschauer, M., Tseng, W., Yim, S., Webster, T., Jacob, S., Du, Q., & Tate, T. (2023). The affordances and contradictions of AI-generated text for writers of English as a second or foreign language. *Journal of Second Language Writing, 62,* 101071. https://doi.org/10.1016/j.jslw.2023.101071

* Yang, C., Li, R., & Yang, L. (2025). Revisiting trends in GenAI-assisted second language writing: Retrospect and prospect. *Journal of Educational Computing Research, 63*(7–8), 1819–1859. https://doi.org/10.1177/07356331251367309

Yetişensoy, O., & Rapoport, A. (2023). Artificial intelligence literacy teaching in social studies education. *Journal of Pedagogical Research, 3.* https://doi.org/10.33902/JPR.202320866

* Yin, X., & Ma, W. (2025). The evolution of language MOOCs in Mainland China: A perspective of sustainable development. *Interactive Learning Environments, 33*(9), 5561–5581. https://doi.org/10.1080/10494820.2025.2483414

Yue Yim, I. H. (2024). A critical review of teaching and learning artificial intelligence (AI) literacy: Developing an intelligence-based AI literacy framework for primary school education. *Computers and Education: Artificial Intelligence, 7,* 100319. https://doi.org/10.1016/j.caeai.2024.100319

* Zhang, Y. (2024). A lesson study on a MOOC-based and AI-powered flipped teaching and assessment of EFL writing model: Teachers' and students' growth. *International Journal for Lesson & Learning Studies, 13*(1), 28–44. https://doi.org/10.1108/IJLLS-07-2023-0085

Zhang, Z., & Chen, M. (2022). To MOOC or not to MOOC: An Empirical Study of Chinese Students' MOOC Learning. *Frontiers in Educational Research, 5*(8). https://doi.org/10.25236/FER.2022.050812

Zhang, Z., & Xu, L. (2024). Student engagement with automated feedback on academic writing: A study on Uyghur ethnic minority students in China. *Journal of Multilingual and Multicultural Development, 45*(8), 3466–3479. https://doi.org/10.1080/01434632.2022.2102175

Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods, 18*(3), 429–472. https://doi.org/10.1177/1094428114562629