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Teaching Materials Research: A Hybrid Systematic Literature Review and Bibliometric Analysis (2020-2025)

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ABSTRACT

The development of teaching materials is a critical area in educational research, especially amidst increasing demands for innovation, digital integration, and learner-centered approaches. Despite growing interest, a comprehensive mapping of trends and theoretical frameworks in teaching materials research remains limited. This study employed a hybrid approach combining a Systematic Literature Review (SLR) and bibliometric analysis to explore scholarly patterns from 2020 to 2025. A total of 913 Scopus-indexed journal articles were selected based on predefined inclusion criteria. The PRISMA framework guided the SLR process, while VOSviewer was used to visualize keyword co-occurrence, citation networks, and author collaborations. Findings reveal that teaching materials research is increasingly robust, with notable growth from 2020 to 2024. The majority of studies focus on digital and multimedia resources, while areas such as contextual and tailored materials remain underrepresented. Six dominant material types were identified: text-based, digital, multimedia, contextual/authentic, problem-based/case-based, and customized. Indonesia emerged as a leading contributor in publication volume. This study highlights the strong alignment of teaching materials research with constructivist, andragogical, and Universal Design for Learning (UDL) frameworks. The dominance of learner-centered and technology-enhanced materials underscores a paradigm shift in instructional design. Future research should expand into underexplored domains, integrate inclusivity principles, and evaluate instructional impact across diverse learning contexts.

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1. INTRODUCTION

Conducting a *Systematic Literature Review* (SLR) on teaching materials has become increasingly essential in the current educational landscape. Teaching materials play a crucial role in enhancing learning quality, supporting instructional objectives, and helping teachers adapt pedagogical strategies to diverse learner needs. Given the rapid growth of educational technologies and research publications,

SLR provides a rigorous and transparent framework for synthesizing existing evidence and informing educational decision-making (García-Peñalvo, 2022; Ghamrawi et al., 2025).

SLRs facilitate the identification of critical criteria for effective instructional materials—such as clarity, authenticity, and cultural relevance—that significantly affect student achievement (Bognar et al., 2024; Bulusan, 2019). Empirical studies further show that digital teaching materials can positively influence students' learning outcomes at different educational levels (Sukmawati & Salimi, 2024). Meanwhile, technological advances such as artificial intelligence and semantic web tools have transformed the design and delivery of instructional content, requiring systematic evaluation of their pedagogical integration (Jensen, 2019; Marchena Sekli et al., 2024).

Beyond improving classroom practices, SLRs contribute to teacher professional development by enhancing methodological competence and supporting the adoption of evidence-based teaching innovations (Bognar et al., 2024; Kurnila et al., 2025). The use of established reporting standards like PRISMA further ensures transparency, reliability, and quality in educational research synthesis (Ghamrawi et al., 2025; Kurnila et al., 2025). Nevertheless, conducting SLRs presents methodological challenges, particularly for novice researchers, due to their time-intensive and complex nature (Carver et al., 2013). Moreover, there remains a lack of SLRs situated in real classroom contexts, especially concerning the integration of digital and technology-enhanced materials (Lai & Bower, 2020).

Despite these challenges, a comprehensive and integrative review combining SLR and bibliometric approaches is still lacking in the field. Such integration is essential to map existing research trends, identify gaps, and explore future directions in teaching materials research (Jiménez Sierra et al., 2023; Khany & Kamalvand, 2022b; Rodríguez-García & Arias-Gago, 2022). Addressing this gap, the present study seeks to answer three key research questions: (RQ1) Does the exploration of teaching materials remain a significant area for future academic inquiry? (RQ2) How is current research on teaching materials distributed across educational contexts? (RQ3) What theoretical and practical implications can be derived to guide future studies?

Answering these questions will provide a holistic understanding of the positioning, development, and strategic contribution of teaching materials research within education. By combining SLR and bibliometric methods, this study aims to consolidate fragmented knowledge, enhance theoretical insight, and guide evidence-based innovation in pedagogical design and policy development.

2. METHODS

This study employed a hybrid Systematic Literature Review (SLR) and bibliometric analysis approach to provide both qualitative and quantitative insights into the research landscape of teaching materials. The combination of these two methods offers complementary strengths: while an SLR ensures a rigorous and transparent synthesis of evidence-based findings, bibliometric analysis quantitatively maps the structural relationships among authors, keywords, and citations (Donthu et al., 2021; Zupic & Čater, 2014). Integrating both approaches allows for a holistic understanding of the field—linking conceptual depth with empirical patterns—and helps overcome the limitations of relying solely on narrative or statistical methods. This hybrid design is particularly valuable for identifying not only *what* is known, but also *how* knowledge about teaching materials is produced, disseminated, and interconnected across disciplines (Aria & Cuccurullo, 2017; Donthu et al., 2021).

The SLR process followed the PRISMA framework to ensure transparency and replicability in data collection, screening, and reporting (Malinda, 2019). The inclusion criteria consisted of:

(1) journal articles published between 2020 and 2025;
(2) English-language publications; and
(3) research within the domains of social sciences and multidisciplinary studies.

Bibliometric analysis was performed using VOSviewer software, which enables visualization of bibliographic networks to identify citation relationships, co-authorship clusters, and keyword co-

occurrence patterns (van Eck & Waltman, 2010). Additionally, bibliometrics was grounded in Garfield's principle that citation patterns can reflect scholarly influence, thereby supporting the evaluation of intellectual contributions and thematic evolution in the field (Garfield, 1972)

To ensure methodological rigor, a quality appraisal was conducted after the eligibility stage. The quality of each included article was assessed based on three main criteria:
(a) methodological clarity (explicit description of research design, data collection, and analysis),
(b) relevance to the construct of teaching materials, and
(c) peer-reviewed publication status.
Articles failing to meet these minimum standards were excluded from the final dataset.

A thematic synthesis was also conducted to complement the quantitative mapping, following the guidance of Thomas and Harden (2008). This involved coding the abstracts and keywords of the included studies to identify emerging themes, which were then clustered into conceptual categories aligned with the six main types of teaching materials (text-based, digital, multimedia, contextual, problem-based, and tailored). This process allowed for triangulation between bibliometric clusters and thematic insights, ensuring both breadth and depth in interpretation.

The search strategy was implemented in the Scopus database on June 23, 2025, using the keyword "Teaching Material." The initial query produced 17,574 documents. Screening by publication year (2020–2025) reduced the dataset to 5,299 records. After filtering for document type (journal articles only), 3,145 records remained. Subsequent refinement by subject area (Social Sciences only) excluded 1,097 documents, resulting in 2,048. Further filtering was applied to ensure open-access and English-language availability, producing a final sample of 913 eligible articles included in the SLR.

While Scopus provides comprehensive and high-quality bibliographic data, it is important to acknowledge the limitations of relying solely on a single database. This dependence may introduce coverage bias, as some relevant studies—particularly those in regional journals or non-English publications—might not be indexed (Mongeon & Paul-Hus, 2016). Therefore, future studies are encouraged to integrate other databases such as Web of Science or Dimensions to enhance representativeness and reduce database-specific bias.
Overall, this hybrid SLR–bibliometric design offers a robust methodological foundation by combining the depth of systematic review synthesis with the breadth of bibliometric mapping, thereby yielding a more comprehensive and evidence-driven understanding of the current state and future trajectory of teaching materials research. (see Figure 1).

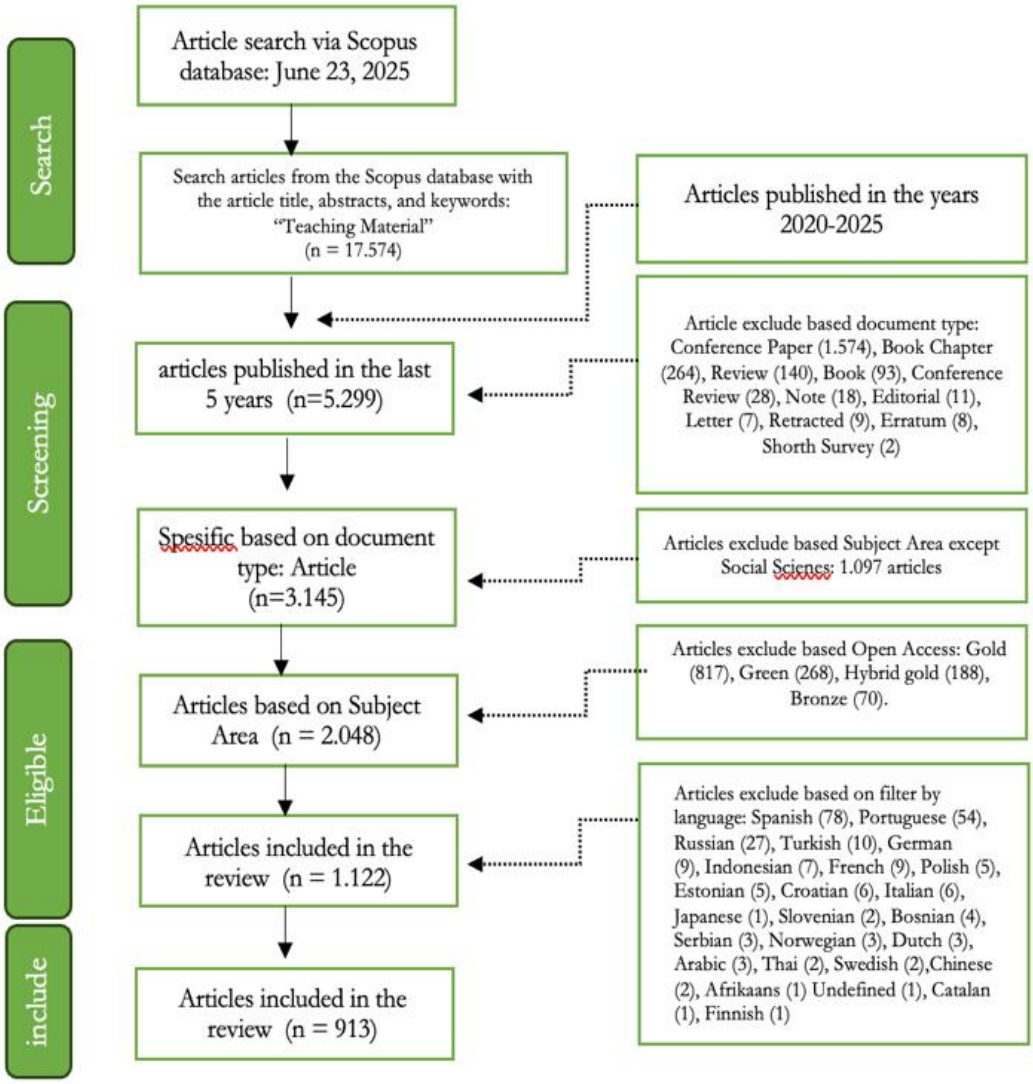

Figure 1. Systimatic Literature Review Information Flow Using PRISMA

The PRISMA diagram illustrates a rigorous and systematic selection process to obtain relevant, scholarly, and field-focused articles within the study of teaching materials. From an initial pool of 17,574 articles, only 913 articles qualified for inclusion in the systematic review based on filters such as publication time frame, document type, field of study, publication access, and language.

This process reflects adherence to international standards in conducting a credible and scientifically accountable Systematic Literature Review (SLR**)**. The resulting documents were then further analyzed in this study to address the following research questions: RQ1**:** Does the exploration of teaching materials remain a significant subject for future academic research? RQ2**:** What is the current research allocation related to teaching materials? RQ3**:** What are the theoretical and practical implications from a future research perspective?

3. FINDINGS AND DISCUSSION

3.1. Results

3.1.1 RQ1: Does the exploration of Teaching Materials remain a subject of continuing significance for future academic research?

The analysis of publication trends from the Scopus database indicates that the topic of teaching materials within the field of social sciences has experienced significant growth over the past five years. From a total of 913 articles systematically selected based on specific inclusion criteria (article type, social sciences subject area, and English language), a consistent upward trend in publications can be observed year by year.

In 2020, there were 141 articles published, which increased to 154 articles in 2021. This growth continued in 2022 with 173 articles, reaching its peak in 2023 with 203 publications. This phenomenon reflects growing scholarly attention to issues surrounding the development of teaching materials, in line with the increasing need for pedagogical innovation and the adaptation of education systems to global and technological changes. Although 2024 saw a slight decline to 186 articles, this number still demonstrates strong academic interest in the topic. Meanwhile, the number of publications recorded in 2025 was 56 articles, which is relatively low compared to previous years. However, this can be attributed to the fact that the 2025 data is still provisional and does not yet reflect the entire year.

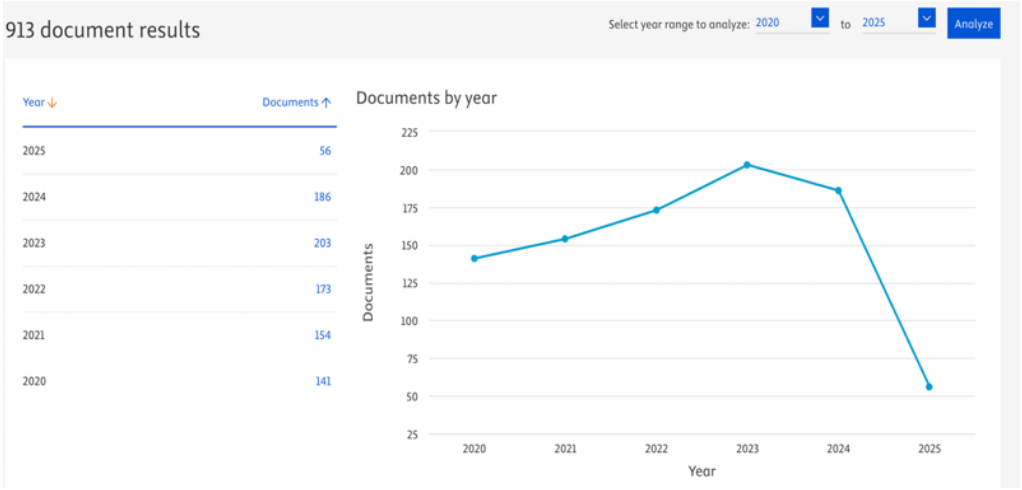

Figure 2. Documents by Year

The analysis of publication trends from the Scopus database indicates that the topic related to teaching materials in the field of social sciences has experienced significant development over the past five years.

Table 1. Documents Per Year

Year	Documents
2020	141
2021	154
2022	173
2023	203
2024	186
2025	56 (incomplete)

Source by Scopus Database

This phenomenon reflects a growing scholarly interest in the development of teaching materials, in line with the demand for pedagogical innovation and the adaptation of education systems to global and technological changes. Although there was a slight decline in 2024 to 186 articles, the number still indicates a strong enthusiasm within the academic community to examine this topic. The number of publications in 2025 was recorded at 56 articles, which is relatively low compared to previous years. However, this can be explained by the fact that the 2025 data is still provisional and does not yet represent the entire year.

Overall, this publication trend reinforces the assumption that research related to teaching materials within the discipline of social sciences is a relevant, dynamic, and continuously evolving field of study, with long-term academic significance. This opens up substantial opportunities for further exploration, particularly in the context of curriculum development, integration of technology in learning, and adaptive and inclusive pedagogical approaches.

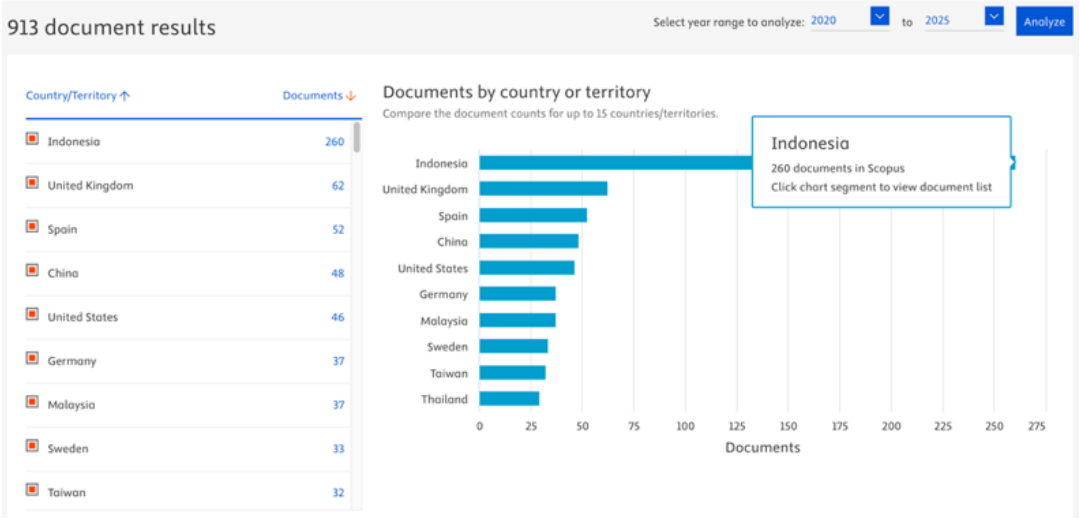

Figure 3. Documents by Country or Territory

The bibliometric analysis of 913 scholarly articles identified from the Scopus database over the period 2020–2025 reveals that the highest number of publications in the field of teaching materials comes from Indonesia, with a total of 260 articles. This figure is significantly higher than that of other countries, such as the United Kingdom (62 articles), Spain (52 articles), China (48 articles), and the United States (46 articles). Indonesia's dominance in publication volume indicates that the issue of teaching material development has become a major concern within the national academic community—ranging from educational policy, contextual learning, to curricular challenges and digital transformation in education. While Indonesia shows the highest number of publications, this does not necessarily indicate the greatest research impact. Further analysis considering citation metrics or journal rankings would be required to confirm influence.

Several other countries also demonstrate active participation in related research, including Germany and Malaysia (each with 37 articles), as well as Sweden, Taiwan, and Thailand, each contributing over 30 publications. This trend reflects a concentration of research in countries that are undergoing or have undergone significant educational system transformation, whether driven by policy changes, human resource development needs, or efforts to enhance teaching quality through evidence-based scientific approaches.

In other words, the data illustrate that the exploration of teaching materials is not merely a local concern but has evolved into a global subject of research, with substantial cross-country engagement. Indonesia's dominance may also reflect the unique needs and challenges of the national education system, which have driven a high volume of publications in this area.

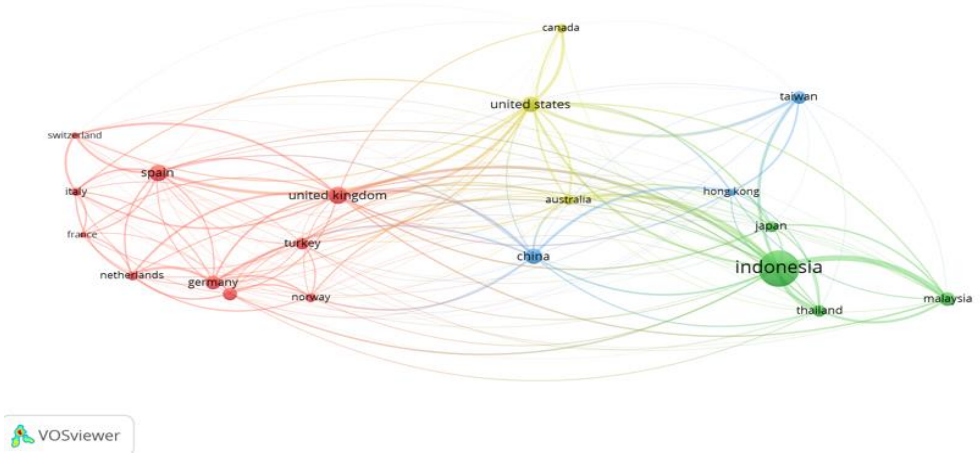

Figure 4. Network Country Visualization

The figure above illustrates a visual map of international collaboration in research on teaching materials using VOSviewer software. Each node represents a country, where the size of the circle indicates the number of publications, and the connecting lines depict the intensity of collaboration or co-authorship between countries. From the visualization, Indonesia appears as the most prominent node positioned at the center of the network, indicating that it has the highest number of publications and actively collaborates with countries such as Malaysia, Thailand, Japan, Taiwan, and Hong Kong. Other countries, including the United Kingdom, United States, China, and Spain, also play key roles in the global collaboration network. Specifically, the United Kingdom serves as a crucial connector between European countries (Germany, France, the Netherlands, Spain) and Asian partners.

The analysis further shows that Indonesia produced the highest number of publications on teaching materials between 2020 and 2025, reflecting strong research productivity and institutional involvement in this field. However, this finding should be interpreted with caution. A high number of publications signifies active research, but it does not automatically imply greater scientific impact. The true influence of a country's scholarly contribution depends on several indicators, such as citation impact, journal quality, and the h-index of authors or institutions. Therefore, despite Indonesia's impressive productivity, further citation-based evaluation is needed to better understand its actual influence in the global academic landscape.

These interconnected collaborations demonstrate that research on teaching materials is inherently global and cross-cultural, underscoring the importance of international cooperation in addressing current educational challenges. The visualization not only highlights the geographical spread of scholarly contributions but also confirms that teaching material development is a rapidly growing and inclusive area of study at the global level. With increasing publication output, broader participation from countries across continents, and strong collaboration patterns, research on teaching materials continues to be highly relevant and strategic. Accordingly, this field is expected to remain significant and offer substantial opportunities for future exploration in line with the ongoing demands of educational transformation and the need for innovative, adaptive, and context-sensitive teaching practices.

3.1.2 RQ2: What Is the Current Research Allocation Related to Teaching Materials?

The research allocation related to studies using the keyword "Teaching Materials", comprising 913 Scopus-indexed documents published over the past five years, can be observed in the following figure 5:

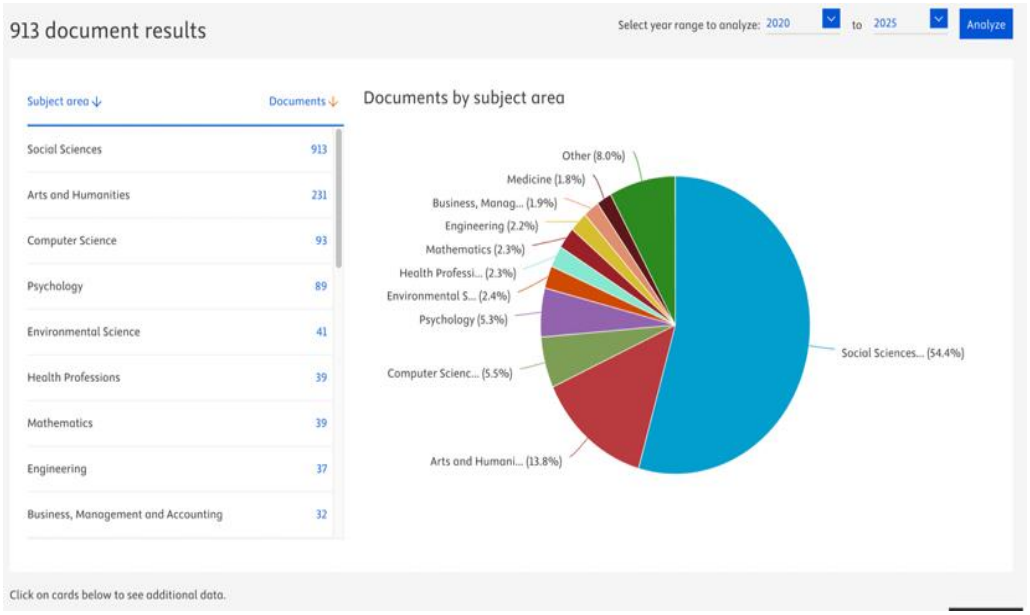

Figure 5. Documents by Subject Area

The analysis of subject area distribution shows that research on teaching materials is predominantly concentrated in the fields of education and social sciences. This dominance reflects the pedagogical nature of the topic and its close connection to curriculum design, instructional strategies, and learning assessment. However, a narrower disciplinary spread limits the broader application of teaching material innovation in other academic domains.

Underrepresented fields such as Science, Technology, Engineering, and Mathematics (STEM), early childhood education, and vocational training remain marginal within the current literature. The scarcity of studies in these areas indicates a potential research gap—particularly in exploring how teaching materials can be designed to support practical skill development, inquiry-based learning, and workplace-oriented competencies. Addressing these underrepresented domains could broaden the relevance and applicability of teaching materials beyond traditional classroom settings.

Furthermore, while digital and multimedia resources have received extensive attention, tailored and contextual teaching materials remain relatively underexplored. This gap suggests that the personalization of instructional resources and the integration of local or cultural contexts are still emerging areas of pedagogical research. Expanding investigation into these themes would enrich our understanding of how teaching materials can better accommodate learner diversity and contextual realities, thereby supporting more inclusive and adaptive learning practices.

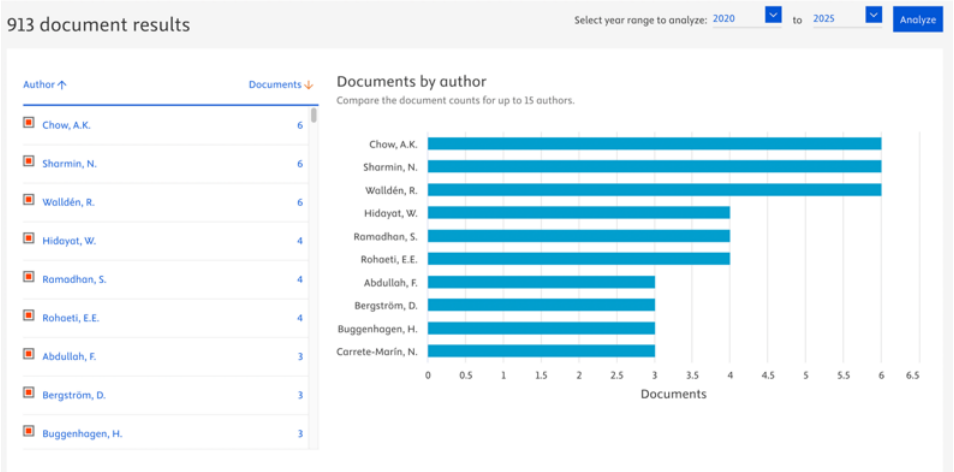

Figure 6. Documents by Author

The figure above displays the top 10 most productive authors in the field of *teaching materials* research during the period 2020–2025, based on Scopus data derived from an analysis of 913 documents**.** The chart highlights three authors at the top position with an equal number of publications: Chow, A.K., Sharmin, N., and Walldén, R., each contributing 6 documents. The next tier includes Hidayat, W., Ramadhan, S.**,** and Rohaeti, E.E.**,** each with 4 publications. Other contributing authors include Abdullah, F., Bergström, D., Buggenhagen, H., and Carrete-Marín, N., each with 3 documents**.**

The presence of several Indonesian authors—Hidayat, W., Ramadhan, S., and Rohaeti, E.E.—demonstrates the significant contribution of Indonesian researchers to the development and scholarly discourse on teaching materials. This finding aligns with the earlier data indicating Indonesia as the leading country in terms of publication output in this field.

Moreover, the distribution of productive authors suggests that research on teaching materials is globally dispersed, not dominated by a single institution or individual. This reflects a high and diverse level of academic interest in the subject, spanning various perspectives—from pedagogical and technological, to cultural and localized contexts. As such, this analysis reinforces the position of *teaching materials* as a rapidly evolving research topic**,** fostering cross-national collaboration and scholarly engagement aimed at enhancing educational quality through adaptive and innovative instructional materials.

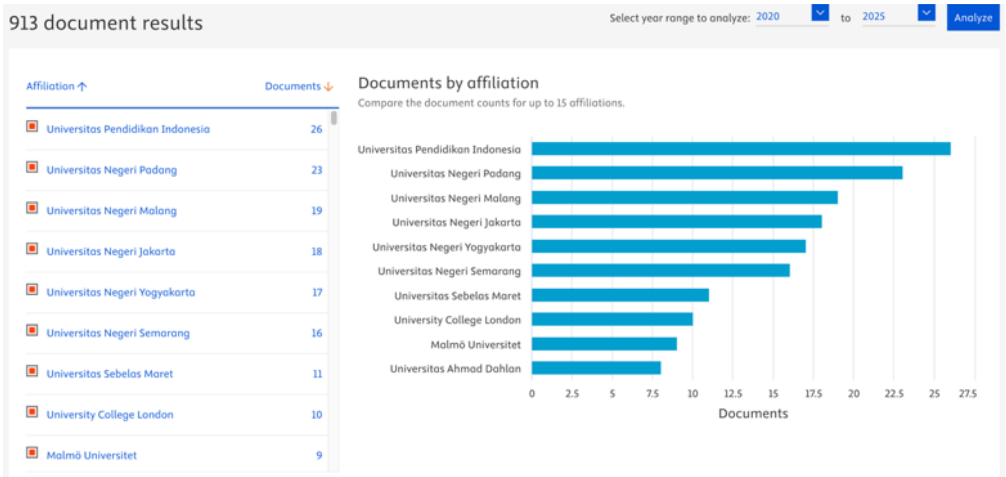

Figure 7. Document by Affiliation

The figure above displays the institutional affiliation distribution for publications on the topic of teaching materials indexed in Scopus between 2020 and 2025. Out of the 913 analyzed documents, the majority originated from higher education institutions in Indonesia, which occupied seven of the top ten positions among the most productive institutions.

Universitas Pendidikan Indonesia (UPI) was identified as the leading institution with 26 publications, followed by Universitas Negeri Padang (23 publications), Universitas Negeri Malang (19 publications), Universitas Negeri Jakarta (18 publications), and Universitas Negeri Yogyakarta (17 publications). Other institutions such as Universitas Negeri Semarang and Universitas Sebelas Maret also contributed significantly, with 16 and 11 publications, respectively.

In addition to Indonesian institutions, contributions from international institutions such as University College London (10 publications) and Malmö University (9 publications) were also observed, indicating that research on teaching materials is not only of national interest but has also gained international recognition and scholarly attention.

The dominance of Indonesian institutions is consistent with the country-level data, which highlights Indonesia as the leading contributor to publications in this field. This reflects the strong commitment and focus of Indonesian educational institutions in developing and exploring innovations in teaching materials—whether from pedagogical, technological, or local contextual perspectives.

Therefore, institutional affiliation serves as a critical indicator of the direction and collaborative strength of research in teaching materials, and it presents significant potential for further development in the future—especially within the context of 21st-century education, which emphasizes flexibility, digitalization, and diverse educational approaches.

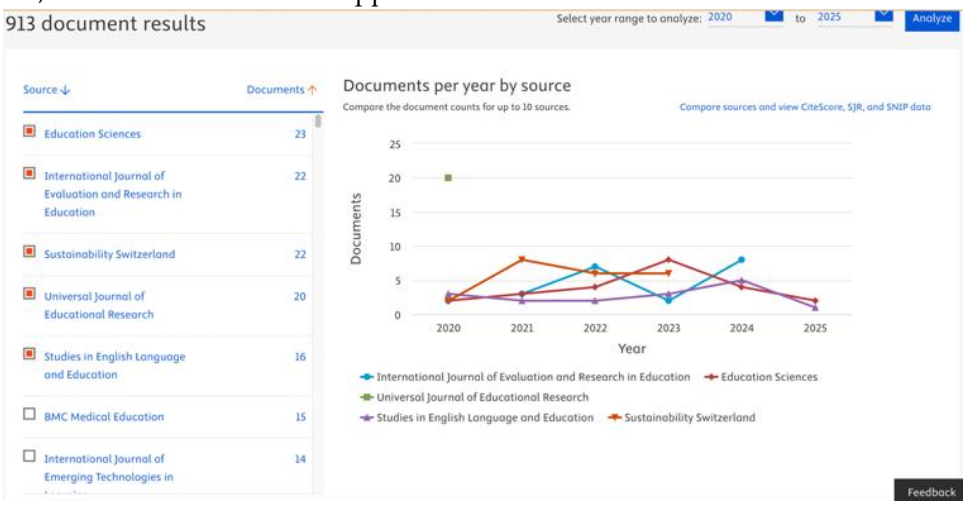

Figure 8. Documents per Year by Source

The figure above presents the top ten journal sources that have published articles on the topic of teaching materials over the past five years (2020–2025). Out of a total of 913 documents, the journals with the highest number of publications are:

Table 2. Document By Top Journals

Journal	Document
Education Sciences	23 articles
International Journal of Evaluation and Research in Education	22 articles
Sustainability (Switzerland)	22 articles
Universal Journal of Educational Research	20 articles
Studies in English Language and Education	16 articles

The annual distribution shows that most publications experienced fluctuations, with peak contributions from several journals occurring in 2023 and 2024. For example, *Sustainability (Switzerland)* recorded a significant increase in 2023, while the *International Journal of Evaluation and Research in Education* saw a surge in 2024. These journals reflect the multidisciplinary approaches in the study of teaching materials, ranging from pedagogical perspectives, sustainability in education, to language use in teaching contexts.

The dominance of these journals also confirms that the topic of teaching materials is not only understood within a local scope but has become a global concern across various fields of study, such as education, sustainability, linguistics, and even medical education. Interestingly, reputable international journals such as *BMC Medical Education* and the *International Journal of Emerging Technologies in Learning* also appear in this list, indicating growing attention to the role of technology and innovation in the design and implementation of teaching materials.

Overall, this data demonstrates that publications related to teaching materials have evolved in a consistent and multidisciplinary manner and are disseminated through various credible and reputable indexed journal channels.

3.1.3 RQ3: What are the theoretical and practical implications from the perspective of future research?

The keyword co-occurrence analysis in the VOSviewer map indicates that research on teaching materials continues to revolve around digital learning, contextual instruction, student engagement, and problem-based approaches. These interconnected clusters demonstrate that the development of teaching materials is closely tied to the evolution of pedagogical paradigms emphasizing learner-centeredness, technology integration, and adaptability. Rather than revisiting each keyword individually, the following discussion interprets these trends through theoretical and practical lenses.

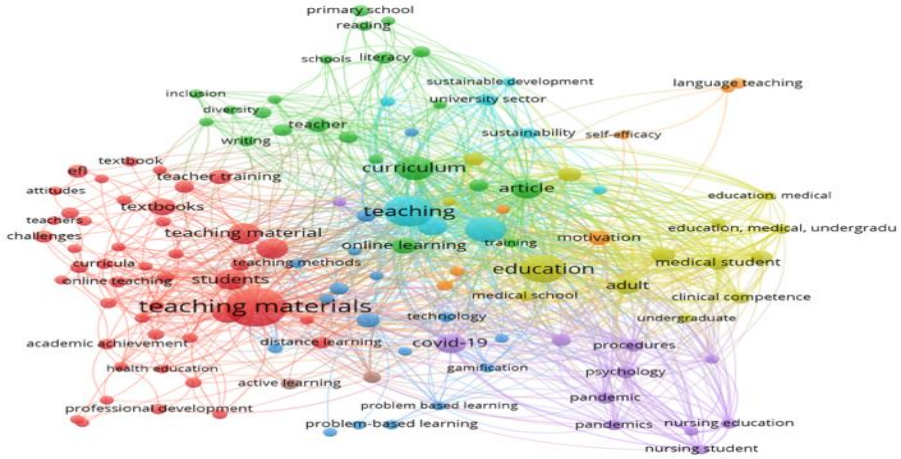

Figure 9. Co-accurance framework and representation of key terms

From a constructivist perspective, the dominance of terms such as *active learning*, *contextual learning*, and *project-based instruction* suggests that learners are positioned as active constructors of knowledge. Constructivism views teaching materials not merely as tools for content delivery but as mediators that shape cognitive engagement and meaning-making. Consequently, the design of teaching materials should prioritize interactive, multimodal, and authentic learning experiences that encourage exploration, reflection, and collaboration. This interpretation aligns directly with the patterns visible in the VOSviewer visualization, where contextual and digital clusters represent the pedagogical shift from teacher-centered instruction toward constructivist, student-driven environments. see Table 3 for the thematic clusters identified from the bibliometric analysis

Table 3. Thematic Clusters and Representative Keywords of Teaching Materials Research

Rank	Keyword	Total Link Strength
1	Teaching	393
2	Education	286
3	Learning	257
4	Adult	244
5	Curriculum	213
6	Teaching Materials	204
7	Medical Student	168
8	Medical Education	145
9	Students, Medical	142
10	Student	113

Source by Vosviwer output

In line with the principles of andragogy, the prevalence of keywords related to *self-directed learning*, *digital literacy*, and *lifelong education* highlights the growing demand for flexible and autonomous learning opportunities. Adult learners, in particular, require instructional materials that are relevant to real-world contexts, build upon prior experience, and allow independent learning pathways. The increasing integration of digital resources and adaptive materials reflects an andragogical orientation, promoting learner autonomy and responsiveness to diverse professional and educational needs.

The theoretical framework of Universal Design for Learning (UDL) adds an essential inclusive dimension to the discussion. Although inclusivity-related keywords appear less frequently in the bibliometric mapping, this underrepresentation indicates a potential research gap. Applying UDL principles—such as providing multiple means of engagement, representation, and expression—can ensure that teaching materials address diverse learner needs, including those with different abilities, learning preferences, and linguistic backgrounds. Integrating UDL into future research agendas would expand the accessibility and equity of teaching materials across global educational settings.

The findings further carry significant practical implications for various educational stakeholders. For curriculum designers, the results underscore the need to embed flexibility, contextual relevance, and technological adaptability into curriculum frameworks. Curriculum development should integrate multimodal resources that support differentiated learning outcomes and promote active knowledge construction.

For teacher educators, the study highlights the importance of preparing teachers to critically evaluate, design, and adapt teaching materials aligned with constructivist and inclusive pedagogies. Professional development programs must therefore equip teachers with the competence to integrate technology and tailor materials to diverse learning environments. For EdTech developers, the results provide direction for creating digital learning platforms that leverage artificial intelligence and data analytics to produce adaptive, learner-centered experiences aligned with UDL principles.

Overall, the convergence of constructivist, andragogical, and UDL perspectives underscores that the future development of teaching materials depends on their ability to bridge theory and practice. By fostering adaptability, inclusivity, and evidence-based design, teaching materials can continue to serve as dynamic instruments that empower both educators and learners in an increasingly digital and diverse educational landscape.

Theoretically, future studies could explore how teaching materials support adult learning theory (Malcolm S Knowles, 1980) and their relevance to constructivist learning environments. It is important to map the relationship between curriculum design and the effectiveness of instructional materials in enhancing learning outcomes (Biggs & Tang, 2011). Researchers and practitioners are encouraged to prioritize the development of instructional materials for adult learners and explore the gap in Islamic-based teaching materials, which were not prominently represented in the current dataset. The results also call for the creation of customized teaching resources tailored to different age groups and backgrounds, particularly through digital or blended learning approaches.

These findings not only provide empirical insights into the current state of teaching materials research but also invite deeper theoretical reflection on how material typologies evolve and embody key learning paradigms.

3.2 Discussion

Based on the bibliometric visualization and analysis presented earlier, various types of teaching materials emerge across multiple disciplines. Generally, teaching materials can be classified into the following categories:

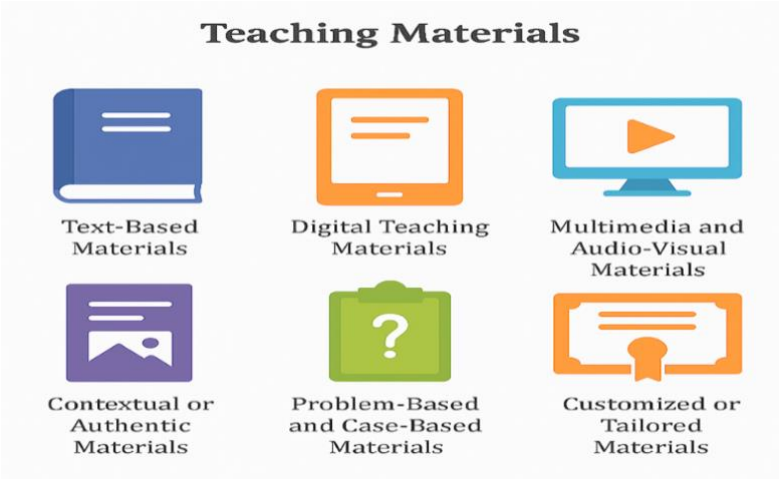

Figure 10. Types Of Teaching Materials

3.2.1 Text-Based Materials

Text-based teaching materials are instructional resources that rely on written content and are widely used due to their affordability, portability, and adaptability to various learning contexts (Ellington, 1987; B. Tomlinson, 2003). These materials, including textbooks, modules, worksheets, and handouts, play a key role in supporting curriculum goals, fostering literacy, critical thinking, and learner autonomy (Richards & Renandya, 2002). Empirical studies demonstrate their effectiveness when contextually relevant and cognitively appropriate; for example, authentic texts improve reading skills and autonomy among EFL learners (Marzban & Davaji, 2011), while printed modules enhance engagement and comprehension in distance learning (Purnomo & Wulandari, 2017). Well-structured textbooks contribute to systematic instruction (Cunningsworth, 1995), and culturally authentic materials strengthen communicative competence and learner engagement (Gilmore, 2007).

3.2.2 Digital Teaching Materials

Digital teaching materials are technology-based instructional resources that enable interactive, flexible, and personalized learning, and can be easily updated and distributed via digital platforms (Choi & Johnson, 2005). These include e-books, LMS content, digital quizzes, MOOCs, interactive games, educational apps, and cloud-based collaborative tools. Empirical studies confirm their effectiveness in improving learning outcomes, motivation, and comprehension across various educational contexts (Choi & Johnson, 2005; Liu et al., 2016). In higher education, digital platforms enhance student engagement, differentiated instruction, and self-directed learning (Al-Emran et al., 2018). Meta-analytic evidence further indicates that digital technologies outperform traditional materials in 74% of reviewed cases (Tamim et al., 2011). Their strengths lie in interactivity, adaptability, real-time feedback, and data-driven personalization, which collectively support learning efficiency and foster digital literacy in the 21st century (Liu et al., 2016; Tamim et al., 2011).

3.2.3 Multimedia and Audio-Visual Materials

Multimedia and audio-visual teaching materials integrate text, images, audio, video, animation, and interactive elements to engage multiple sensory channels and enhance learning effectiveness (Mayer, 2001). Empirical evidence shows that such materials improve comprehension, motivation, and retention by facilitating dual-channel processing, as explained in the Cognitive Theory of Multimedia Learning (Mayer, 2001)). Studies demonstrate positive outcomes in higher education, including increased engagement, creativity, and collaboration (Neo & Neo, 2009), enhanced listening skills and cultural awareness in language learning (Basal, 2015), and improved learner satisfaction and performance across disciplines through video podcasts and visual media (Kay, 2012). These findings indicate that multimedia and audio-visual resources function not only as supplementary tools but as central pedagogical strategies in digital and blended learning environments.

3.2.4 Contextual and Authentic Materials

Contextual or authentic materials are teaching resources derived from real-life situations that connect classroom learning to practical contexts, enhancing relevance and learner engagement. These materials—such as newspapers, maps, audio/video from real interactions, and project-based tasks—support meaningful learning by reflecting learners' experiences. Authentic materials provide natural language input and cultural context, thereby improving fluency, comprehension, and communicative competence (Berardo, 2006; Gilmore, 2007). They also foster learner autonomy and cognitive engagement through real-world tasks (Nunan, 1999). Empirical evidence shows increased motivation, attention, and self-efficacy when learners interact with authentic resources (Peacock, 1997). In vocational and professional settings, contextualized materials enhance problem-solving and engagement by situating theoretical concepts in job-relevant scenarios (Berns et al., 2013).

3.2.5 Problem-Based and Case-Based Teaching Materials

Problem-based and case-based teaching materials are constructivist-oriented resources that engage learners in solving authentic or simulated problems through inquiry, collaboration, and self-directed learning. Problem-based materials focus on open-ended scenarios requiring learners to identify knowledge gaps and construct solutions, while case-based materials present detailed real-life narratives for analysis and reflection (Barrows & Tamblyn, 1980). Empirical evidence shows that both approaches enhance deep learning, diagnostic reasoning, learner autonomy, and interdisciplinary application of knowledge (Savery, 2006; Schmidt et al., 2011). Case-based learning also fosters engagement, conceptual retention, and ethical decision-making across fields such as science, business, and law (Herreid, 2001; Kreber, 2001). Additionally, PBL improves meta-cognitive awareness, creativity, and collaboration, particularly in online and interdisciplinary settings (Hung, 2011).

3.2.6 Customized or tailored teaching materials

Customized or tailored teaching materials are learner-centered resources designed to address individual differences in readiness, interests, and cultural backgrounds, embodying the principles of differentiated and inclusive instruction (Gay, 2010; C. A. Tomlinson, 2001). Research shows that adaptive and culturally responsive materials enhance engagement, persistence, and achievement, particularly among diverse learners (Corno & Snow, 1986; Hall, 2002). Adaptive technologies such as intelligent tutoring systems further support personalization and yield outcomes comparable to human tutoring (Steenbergen-Hu & Cooper, 2013; VanLehn, 2011), affirming the role of tailored materials in fostering equitable and effective learning environments.

The typology of teaching materials identified in this study—comprising text-based, digital, multimedia or audio-visual, contextual or authentic, problem-based or case-based, and customized resources—represents the diversity and evolution of instructional design in contemporary education (Rahman & Rahim, 2023; B. Tomlinson, 2013). Rather than treating these categories as discrete entities, their interconnections reveal how pedagogical paradigms have shifted toward learner-centered,

technology-enhanced, and flexible models of learning (Bognar et al., 2024; de Oliveira Rodrigues, 2024). This evolution aligns closely with the theoretical underpinnings of constructivism, andragogy, and the Universal Design for Learning (UDL) framework.

From a constructivist standpoint, the movement from static, text-based materials toward interactive and multimedia formats reflects an epistemological shift from content transmission to active knowledge construction (Bada & Olusegun, 2015; Hernández & Reyes, 2021). Teaching materials increasingly function as mediational tools that promote inquiry, collaboration, and reflection—key processes emphasized by constructivist learning theory (Sari & Halim, 2022). Contextual and problem-based materials, in particular, embody constructivist ideals by situating learning within authentic, meaningful experiences that encourage students to apply knowledge creatively(Khany & Kamalvand, 2022a; Nuraeni & Halim, 2021).

Informed by andragogical principles, the rise of digital and customized learning resources underscores the growing importance of autonomy, relevance, and self-direction in education (Brookfield, 2020; M S Knowles et al., 2015). Adult learners benefit from materials that adapt to prior knowledge and individual learning trajectories, supporting lifelong learning beyond formal classrooms (Sahin & Çelik, 2024). The flexibility of digital and hybrid resources therefore reflects a paradigmatic response to the needs of adult and professional learners who demand contextualized, goal-oriented materials (Rahman & Rahim, 2023).

Furthermore, the inclusion of UDL principles in teaching material design expands the theoretical implications of inclusivity and accessibility (CAST, 2018; Meyer et al., 2014). While the bibliometric mapping indicated limited representation of inclusivity-related keywords, integrating UDL perspectives enables the creation of materials that accommodate diverse learner profiles and eliminate participation barriers (Al-Azawei et al., 2016; Rao & Meo, 2016). Through multiple means of engagement and representation, UDL bridges the gap between equity and innovation in material development (Rodríguez-García & Arias-Gago, 2022).

In synthesis, these typologies collectively illustrate the convergence of pedagogical theory and technological practice. The theoretical implications extend beyond classification, offering a framework for how materials can embody active learning, self-regulation, and inclusivity (Bognar et al., 2024; Donthu et al., 2021). Future research should therefore move beyond cataloging material types and instead investigate how each form operationalizes core learning theories and supports adaptive, equitable, and transformative educational experiences (Rahman & Rahim, 2023; Rodríguez-García & Arias-Gago, 2022).

4. CONCLUSION

This systematic review confirms that the exploration of teaching materials remains a highly significant and evolving area of academic research (RQ1). The increasing volume of publications between 2020 and 2025 reflects sustained scholarly interest, particularly in response to pedagogical innovation, digital transformation, and the growing demand for learner-centered education. Bibliometric evidence further indicates that current research allocation is predominantly concentrated within the Social Sciences, followed by Arts and Humanities, Psychology, and education-related fields (RQ2), highlighting the central role of teaching materials in shaping instructional practices across diverse educational contexts.

From a theoretical and practical perspective (RQ3), this study demonstrates that research on teaching materials is closely connected to key learning theories such as constructivism, andragogy, and socio-cultural learning. The identification of six major types of teaching materials—text-based, digital, multimedia and audio-visual, contextual or authentic, problem-based and case-based, and customized or tailored materials—illustrates the multidimensional nature of instructional resources in contemporary education. These material types collectively emphasize adaptability, learner

engagement, contextual relevance, and technological integration, reinforcing the need for instructional design that aligns with both pedagogical theory and real-world learning demands.

Nevertheless, several limitations should be acknowledged. This review is limited to Scopus-indexed publications, which may exclude relevant studies from regional databases, practitioner-oriented journals, or grey literature. In addition, the analysis is based on bibliometric patterns rather than in-depth evaluations of learning outcomes, which restricts conclusions regarding the effectiveness of specific teaching materials in practice. Furthermore, the categorization of teaching materials may overlap in applied settings, particularly in blended and digitally mediated learning environments.

Despite these limitations, the findings offer important implications for policy and practice. Educational policymakers are encouraged to support flexible curriculum frameworks that promote the development of adaptive, inclusive, and technology-enhanced teaching materials. Institutions should invest not only in digital infrastructure but also in professional development that strengthens educators' capacity to design and evaluate context-responsive instructional resources. For future research, more empirical and mixed-method studies are needed to examine the impact of specific types of teaching materials on learning outcomes across disciplines and educational levels. Such efforts will contribute to bridging the gap between theory and practice and ensure that teaching materials continue to play a strategic role in advancing educational quality and equity.

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