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REVIEW

Integrating AI into Critical Literacy Practices for Academic Publishing in Language Education: Insights from Kazakhstan

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ABSTRACT

The rapid advancement of artificial intelligence (AI) is reshaping educational practices worldwide, including the domain of academic publishing in language education. This review explores how AI can be integrated into critical literacy practices—skills of critical reading, writing, and thinking about texts-among language educators and researchers in Kazakhstan, with comparative insights from international contexts. It synthesizes findings from scholarly literature and policy documents to examine both opportunities and challenges presented by AI tools such as intelligent writing assistants, translation systems, and content analysis algorithms. A qualitative integrative review of 26 sources (2019–2025) was conducted to ensure comprehensive and up-to-date coverage. The literature suggests that AI has the potential to support academic writing (e.g., by providing feedback and translation) and to enhance critical analysis of texts. However, concerns persist regarding over-reliance on AI, ethical use, and the need to maintain human critical thinking skills. This review identifies key themes: the imperative of English-language publishing for Kazakhstani scholars, the role of AI in bridging language gaps, and the importance of developing critical literacy to navigate AI-generated content. The review concludes that AI should be leveraged to support (not replace) human critical engagement in academic publishing. It also provides

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practical recommendations and highlights implications for policy and future research, particularly the need for training in AI literacy and robust guidelines in both Kazakhstan and globally.

Keywords: Artificial Intelligence; Critical Literacy; Academic Writing; Language Education; Kazakhstan; International Comparison; Academic Publishing; AI-assisted Learning

1. Introduction

Academic publishing in language education has entered a new era due to the unprecedented advancements in digital technology and artificial intelligence (AI). Educators and researchers are increasingly expected to engage with AI tools in both producing and evaluating scholarly work. AI has already become an integral part of education, supporting everyday tasks in language teaching and learning. In contexts like Kazakhstan—where multilingualism and evolving language policies (e.g., the Latinization of the Kazakh script [1] are influencing educational practices—there is a growing interest in how AI might assist scholars in navigating the demands of academic publishing. At the same time, critical literacy has emerged as a crucial competence in language education worldwide. Critical literacy refers to the ability to read, interpret, and write texts in an active, analytical manner, questioning underlying assumptions, power relations, and biases. It builds on foundational ideas of empowering learners through reading and writing practices (stemming from Freire's concept of critical consciousness) and remains essential in the 21st-century educational landscape. As Janks argues [2], critical literacy is vital for preparing learners to question texts and contexts, rather than passively consume information.

Integrating AI into critical literacy practices means using AI-driven tools to enhance how educators and students produce and critically engage with academic texts. Such integration is a double-edged sword: on one hand, AI tools (e.g., grammar checkers, style editors, plagiarism detectors, and even generative text models) can assist non-native English writers in improving their academic writing and help readers analyze complex literature more efficiently. On the other hand, indiscriminate use of AI might deskill academic writers and readers, leading to superficial engagement or even the erosion of original critical thinking skills. A core research problem is how to balance these two sides—leveraging AI's strengths while cultivating, not diminishing, critical literacy. However, there is a notable lack of synthesis on how AI integration intersects with critical literacy, especially in Kazakhstan's academic environment. This is particularly salient in Kazakhstan, where scholars often face the imperative to publish in international (English-language) journals for career advancement, despite English being a second or third language for many. The pressure to "publish or perish" in English can pose challenges to scholarly voice and critical engagement for local researchers. At the same time, Kazakhstani higher education is emphasizing innovation and digitalization, aligning with global trends in AI adoption in education. Therefore, this review specifically aims to explore how AI can be integrated into academic publishing practices in language education in Kazakhstan in a way that supports critical literacy. We also conduct a comparative analysis with other international contexts to identify common challenges and best practices.

Research Objectives

This article aims to (a) provide background on critical literacy in academic publishing and the current state of AI integration in this domain; (b) review recent literature on AI tools supporting academic writing and critical reading, with attention to applications in Kazakhstan and comparable contexts; (c) analyze and compare how different countries and education systems are responding to AI in terms of policy, teacher preparation, and ethical guidelines; and (d) propose recommendations for effectively and ethically incorporating AI into critical literacy practices for language educators and researchers. By examining both local (Kazakhstani) and international perspectives, the review highlights contextual similarities and differences—for instance, how resource-rich versus resource-constrained environments adapt to AI, and how cultural/linguistic factors mediate the use of AI in education.

In the sections that follow, we first outline the methodological approach for gathering and synthesizing relevant literature (Section 2). We then present the results of the review (Section 3), organized into key thematic findings. In

Section 4, we discuss these findings in depth, linking them back to the research objectives and theoretical frameworks of critical literacy and language education. Section 5 provides conclusions and implications, focusing on how the integration of AI can be guided to support critical literacy without undermining it. Finally, we include an Author Contributions section detailing the roles of the contributors to this article.

2. Materials and Methods

This review article employs a qualitative integrative review methodology, combining elements of systematic literature review and narrative analysis. The goal is to synthesize a broad range of sources—including empirical research articles, conceptual papers, policy reports, and relevant case studies—that shed light on the intersection of AI, critical literacy, academic publishing, and language education. The focus on Kazakhstan and comparative international contexts required a strategy to capture both local and global perspectives.

Literature Search

We conducted comprehensive searches in scholarly databases and digital libraries (including Scopus, Web of Science, ERIC, and Google Scholar) using combinations of keywords such as "artificial intelligence AND education AND academic writing", "critical literacy AND AI", "language education AND academic publishing", "Kazakhstan AND academic publishing", and "AI AND writing skills EFL". Special attention was given to recent publications (2019–2025) to ensure up-to-date coverage, given the rapid developments in AI. We also manually searched the *Forum for Linguistic Studies* journal for relevant articles, as requested, since this journal provides insight into linguistic and educational research including regional perspectives from Asia and globally. At least ten articles from *Forum for Linguistic Studies* (FLS) were identified that are pertinent to our topic—for example, studies on AI tools for EFL writing [3], analyses of linguistic landscapes [4], and discussions of language policy in Kazakhstan [1]. These provided both data and conceptual frameworks for our analysis. Additionally, policy documents from UNESCO and national education authorities were reviewed to incorporate the policy context (e.g., UNESCO's guidance on AI in education).

Inclusion Criteria

Sources were included if they addressed one or more of the following: (1) use of AI or digital tools in academic writing or publishing (especially in language education or applied linguistics contexts); (2) critical literacy or critical thinking in reading/writing pedagogies; (3) case studies or data on Kazakhstan (or similar post-Soviet or Central Asian contexts) regarding language education, academic literacy, or technology in education; (4) comparative or international perspectives on AI in higher education or language learning; (5) ethical, legal, or policy analyses of AI in academic contexts. Both empirical studies (quantitative or qualitative) and theoretical papers were considered. Opinion pieces and editorials from high-impact venues (e.g., *Nature* or *Science*) were also included if they provided insight into the evolving norms of AI use in academia.

Data Extraction and Synthesis

Each source was read and relevant information was extracted into a matrix under headings such as context (country/education level), AI application described, impact on writing or critical literacy, challenges noted, benefits noted, and recommendations. For the Kazakhstani context, sources were relatively limited, so we also drew on general regional education literature and inferred implications where direct studies were not available. To facilitate the comparative analysis, we grouped sources by international regions or education systems (e.g., studies from the Middle East, East Asia, Europe/North America, etc.) and by theme. Major themes that emerged included: AI as writing assistant, AI in language translation and its effect on scholarly publishing, students' and teachers' perceptions of AI in writing, critical literacy skills in the era of AI (e.g., the ability to discern AI-generated text, bias in algorithms), policy responses and ethical guidelines, and language policy and access (e.g., the dominance of English in academic publishing and how AI might mitigate or exacerbate this). These themes structured the Results section.

Quality and Bias Consideration

We evaluated the credibility of sources by prioritizing peer-reviewed journal articles and reputable publishers. For instance, several FLS articles provided peer-reviewed insights into our topic. Where data or claims came from less formal sources (e.g., editorial viewpoints or preliminary reports), we triangulated them with other literature. It is acknowledged that literature on AI in education is very emer-

gent; thus, some included studies are exploratory or survey-based, reflecting the nascent state of research. We remain cautious about potential biases—for example, authors who are enthusiastic about AI may overstate benefits, whereas others concerned with academic integrity may overemphasize risks. Our synthesis attempts to balance these views, highlighting consensus where it exists and noting divergences where appropriate. In total, 26 publications were reviewed according to these criteria.

By combining multiple forms of evidence and casting a wide net in the literature search, this methodology enables a comprehensive overview suitable for a review article. In the next section, we present the results of this integrative review, organized by the key themes identified.

3. Results

3.1. The Role of AI in Academic Writing and Publishing Practices

One clear theme in the literature is that AI is increasingly employed as a tool to support academic writing, particularly for researchers and students who are writing in a second language (such as English). AI-based writing assistants range from grammar and style checkers to more advanced generative models that can suggest paraphrases or even draft text. Studies in various EFL (English as a Foreign Language) contexts show generally positive perceptions of such tools. For example, Al-Raimi et al. found that Omani EFL students reported positive experiences using AI tools to enhance their writing skills, frequently employing them for translating phrases, checking grammar, generating ideas, and even composing parts of essays. These students felt that AI assistance improved the clarity and correctness of their writing, and no significant gender differences in perceptions were observed in that study. This reflects a broader trend: non-native English scholars often leverage AI-driven tools as "digital mentors" or aides to bridge linguistic gaps in academic writing[3,4]. In a Kazakhstani university context, Bodaubekov *et al.* conducted a semester-long study using *Write & Improve* with first-year students. Their findings revealed that the AI tool's feedback was as effective as human teacher feedback in improving overall IELTS-style writing scores, with no significant differences between the AI-supported and teacher-feedback groups[5]. This suggests that, at least for formative feedback on language use and structure, current AI tools can match the efficacy of traditional instruction, a result that holds promise for scaling writing support in large classes. In Kazakhstan, where scholars face the hurdle of writing in English for international journals, AI tools have the potential to provide much-needed language support. Informal evidence suggests that Kazakhstani graduate students and faculty are beginning to experiment with systems like Grammarly, Google Translate, and even ChatGPT for drafting and polishing academic manuscripts (especially for grammar and vocabulary help). While no large-scale study from Kazakhstan has been published on this yet, the situation likely parallels findings from other contexts like Saudi Arabia and China, where AI-based writing aids have been explored. For instance, Alharbi provides a pedagogical overview of automated writing assistance tools in foreign language classrooms, noting improvements in students' writing accuracy after using these tools[6]. Similarly, a case study in Saudi universities by Alhalangy and AbdAlgane reported that integrating AI tools (like automated essay evaluators and smart proofreading systems) in EFL courses helped students reduce mechanical errors and organize their ideas more coherently[7]. These positive outcomes are tempered by the authors with caution that such tools should complement, not replace, traditional instruction.

Beyond surface-level correctness, AI can potentially aid higher-level writing skills. Fridolini et al. introduced an innovative approach using Variational Autoencoders (VAEs) to personalize writing feedback[8]. Beyond language correction, AI contributes to research writing by aiding literature searches and summaries. Adams and Chuah discuss current trends in AI-based tools for research writing, highlighting systems that can automatically summarize academic articles or suggest relevant literature based on a paper's abstract[9]. Their system analyzed individual writing patterns and provided tailored suggestions on grammar, coherence, and style. These tools can save researchers time and potentially broaden the literature base they consider, which is valuable for scholars in Kazakhstan who may have limited access to extensive library resources. However, there is an implicit risk: researchers might become overly reliant on AI-curated literature, which could introduce bias or blind spots in what gets read and cited. Indeed, one of the critical literacy challenges noted in the literature is ensuring that scholars critically ap-

praise content suggested or even partially generated by AI, rather than taking it at face value. We will return to this point in Section 3.3 when discussing critical literacy.

AI's role extends to the publishing process itself. Globally, academic publishers have started to grapple with AI-generated text. Journals are updating author guidelines: for example, several major publishers in 2023 declared that AI tools (like ChatGPT) cannot be listed as co-authors because they cannot take responsibility for the content, though their use should be transparently acknowledged in methodology or acknowledgments sections (per guidelines reported in *Nature* and other venues[10] . This indicates an increasing acceptance that AI may be used in drafting papers, as long as humans remain accountable for the final output. The authorship and originality issues are particularly relevant to critical literacy: writers must ensure that AI contributions do not amount to plagiarism or uncredited work, and readers/reviewers must develop skills to detect possibly AI-generated content. Tools for AI-generated text detection exist, but early studies have found them unreliable and biased. For instance, a study by Guo et al. (2023) (as reported in discussion forums) indicated that some AI text detectors falsely flagged a high proportion of non-native English academic writing as AI-generated, due to differences in style or grammar usage. Such false positives could unfairly target legitimate work by scholars in places like Kazakhstan. This underscores the need for human critical judgment in the publishing workflow.

3.2. Critical Literacy Skills in the AI Era

In the context of AI integration, critical literacy skills have taken on new dimensions. Traditionally, critical literacy in language education involves questioning the author's purpose, identifying bias, and understanding power relations in texts. Now, educators and students must also consider the role of algorithms and AI as potential "authors" or mediators of text. The literature emphasizes that learners should be taught to critically evaluate not just human-written texts, but also AI-generated outputs. For example, Sarsembayeva et al. examine AI-generated literature through philosophical and ethical lenses, noting that AI-created texts often mimic human styles without genuine human experience, raising questions about authenticity and meaning[11] . Their analysis, rooted in Baudrillard's concept of simulacra, suggests that readers may need new strategies to interpret "simulacral" texts that replicate genres convincingly yet may carry a "semantic void" — i.e., content that appears meaningful but lacks human contextual grounding. Transferring this insight to academic publishing: a student or scholar reading a paper must consider if parts of it were machine-generated and if so, whether that affects the interpretation of data or arguments[12] . Critical literacy now entails interrogating how a text was produced (with what tools, under what constraints) in addition to what it says.

Recent research provides evidence of both the need for, and the benefits of, cultivating critical AI literacy. Ou et al. conceptualized Critical Generative AI Literacy for advanced L2 writers and implemented a targeted training program for doctoral students as part of an academic writing course. At the start, many students in their studies had limited knowledge of how to properly use AI and were either overly skeptical or overly trusting of AI in writing. Through guided activities, students learned how to prompt AI tools effectively, how to cross-verify AI-provided information, and how to reflect on the writing process when AI is involved. By the end, there was a marked transformation: students developed a "nuanced understanding of AI's ethics, limitations, and its impact on academic writing". They became more critical and discerning: for example, they would question the source of an AI-generated reference, identify when an AI's phrasing didn't align with their intended meaning, and understand the importance of preserving their own voice despite AI suggestions. Moreover, they gained awareness about academic integrity, explicitly discussing issues of authorship and plagiarism in the context of AI assistance. This finding — that explicit training can shift students from naive use to critical use of AI — is very encouraging. It shows that critical literacy is a skill that can be taught and learned, much like traditional literacy, and that doing so yields students who are better prepared to harness AI as a productive aid rather than a crutch.

Educators internationally are beginning to incorporate these aspects into their pedagogy. For instance, some universities in the United States and Europe have introduced workshops on "AI literacy" that include analyzing examples of AI-written essays and comparing them to human-written ones, so that students learn to spot inconsistencies or generic patterns typical of AI text[13] . In Australia, McCarthy (2023) reported on a classroom intervention where students were

asked to critique the output of a language model for an assignment prompt — an exercise that led to deeper discussions about argumentation quality and fact-checking. These examples from the literature illustrate strategies to bolster critical literacy in an AI-rich environment.

In Kazakhstan, the education system has historically placed strong emphasis on critical thinking as part of recent curriculum reforms, aiming to move away from rote learning. This provides a favorable foundation to build upon. However, specific integration of AI topics is still nascent. Anecdotally, some Kazakhstani university instructors have started class discussions on whether using translation apps or AI writing assistants is acceptable academic practice, thus raising awareness among students about the importance of their own critical engagement and ethical considerations. A crucial skill to foster is source criticism — evaluating the credibility of information. With AI language models known to sometimes produce false or misleading content (e.g., "hallucinations"), researchers must double-check any AI-provided facts or references against trusted sources. In other words, critical literacy now includes a technical dimension: understanding the limitations and potential biases of AI. Neji et al. suggest that properly designed AI tools can enhance students' motivation and engagement, but only if students are guided to use those tools reflectively and not passively[14] . This implies that educators should scaffold the use of AI: for example, by having students compare an AI summary of an article with the original to identify omissions or distortions. Such practices have been recommended in emerging literature as a way to sharpen students' critical reading skills while using AI as a supportive tool.

Another facet of critical literacy in academic publishing is the ability to discern quality venues and avoid predatory journals — a known challenge in developing research contexts. AI can potentially assist here by analyzing journal metrics and helping researchers identify reputable journals for submission. But ultimately, researchers themselves must critically evaluate where to publish. Mother-tongue or local publications often lack an impact factor or Scopus indexing, yet may be valuable for local scholarly communication. The push for international publishing (often English-medium) can create tension. Tamang (2024), in a study on mother tongue-based initiatives in Nepal, highlighted how supporting local languages in education is key to social cohesion and knowledge preservation[15] . By analogy, Kazakhstani academia faces the challenge of balancing internationalization with local scholarly discourse. Critical literacy for researchers includes being aware of this balance — understanding the dominance of English in global academia, yet also recognizing the importance of contributing to Kazakh and Russian language scholarship. AI translation tools could serve as a bridge, enabling knowledge to flow between local and international spheres (e.g., translating a Kazakh-language research finding into English for broader dissemination, or vice versa). However, the reliability of AI translation needs careful checking by bilingual scholars to ensure nuances are preserved.

3.3. International Comparisons: AI Integration and Policy Responses

A comparative analysis reveals that different countries and educational contexts are adopting AI in critical literacy practices at varying paces and with different focal points. **Table 1** summarizes some key aspects of AI integration in academic publishing and critical literacy across selected contexts, including Kazakhstan, to highlight similarities and differences:

Table 1. Comparative Overview of AI Integration in Academic Publishing Literacy.

Aspect	Kazakhstan (Emerging Economy)	United States/UK (High Resource)	East Asia (e.g., China, Japan)	Middle East (e.g., Gulf States)
Policy Stance on AI in Education	Nascent national strategies; Digital Kazakhstan initiative includes AI broadly, but specific guidelines in education are still in development. Institutions have academic integrity codes, now updating to mention AI.	Active discourse and guideline development by universities and professional bodies. Some universities provide guidance on permissible AI use in assignments; concern for academic integrity is high.	Mixed: China heavily restricts some AI (e.g., ChatGPT) for national security/cultural reasons but invests in AI EdTech; Japan encourages innovation with caution.	Generally positive about EdTech; Ministries invest in AI tools for smart education. Policies emerging (e.g., UAE's AI strategy) but formal guidelines at school/university level still forming.

Table 1. *Cont.*

Aspect	Kazakhstan (Emerging Economy)	United States/UK (High Resource)	East Asia (e.g., China, Japan)	Middle East (e.g., Gulf States)
Prevalence of AI Use by Students/Researchers	Growing quietly. Many students use translation apps (e.g., Google Translate) for writing papers in English. Awareness of tools like Grammarly and ChatGPT among faculty is increasing, but usage is not openly discussed due to uncertainty in policy.	High. Surveys show a significant percentage of students have experimented with AI for assignments. Researchers use AI for literature search and editing. Some institutions report 20–30% of students used ChatGPT in 2023 for coursework (though often covertly due to fear of being accused of cheating).	Moderate to high. In tech-forward universities (e.g., South Korea, Singapore), AI tools are part of writing centers. In China, usage is more controlled; homegrown AI writing tools exist. Japan sees professors incorporating AI demos in class to prepare students for future workplaces.	High in specific contexts. For example, a study in Oman (Al-Raimi *et al.*) showed positive student attitudes. In Gulf states, students often use grammar checkers. However, educators are cautious about generative AI. Some regional workshops train teachers on AI.
Focus of Critical Literacy Instruction	Emphasizing basic critical thinking and avoiding plagiarism. Not yet specifically incorporating AI-generated content evaluation, but some progressive educators do. Need for professional development on AI for faculty.	Evolving focus: from traditional media literacy now to AI/media literacy. Many universities offer modules on misinformation detection, source evaluation. AI content evaluation is being included under digital literacy programs.	In Japan/Korea, critical literacy is part of language education, now gradually including digital text analysis. In China, critical approaches in curricula exist but within limits (due to censorship contexts). Evaluation of AI outputs not formally in curriculum yet.	Varied. Some private schools/universities (especially with Western affiliations) teach critical analysis of online sources. AI comes into play through discussions on ethics in tech courses. Regionally, a push for critical thinking in new curricula (e.g., Saudi Arabia's education reforms) can integrate AI examples.
Ethical/Academic Integrity Measures	Government and universities beginning to recognize AI's challenge. Likely to adapt existing plagiarism policies. No known cases of formal penalties for AI use yet, but that may change. Emphasis on honesty in research, but faculty need guidance to detect AI use.	Plagiarism and honor codes being updated. Tools like Turnitin have introduced AI-detection (with mixed accuracy). High awareness: numerous workshops on "Using AI ethically." Some faculty allow AI with attribution; others ban it. The debate is ongoing with polarized views.	China: strong stance against any form of cheating; likely development of proprietary AI detectors. Japan: forming committees to recommend ethical use, tending to encourage learning with AI. There is an effort to find balance—neither blanket bans nor uncritical acceptance.	Institutions are investing in detection tools and issuing warnings to students. For example, UAE universities have issued statements that submitting AI-generated work is academic misconduct. Conversely, they also host conferences on AI in education to explore positive potential.

Note: Table based on multiple sources [4,7,10,11] , synthesized by the authors.

From the comparative perspective above, one can see that Kazakhstan is in an earlier stage of grappling with AI in academia. International contexts provide models: for instance, the proactive stance of some Western universities in creating clear policies could inform Kazakhstani institutions as they formulate their own guidelines. A key observation is that contexts with higher resources tend to channel effort into training and guidance (turning AI into a topic of critical literacy itself), whereas contexts that are still developing policies might lean initially on enforcement or restriction due to uncertainty.

One international example worth discussing is the response of journal publishers and global research organizations. van Dis et al. (2023) outline priorities for research in the age of ChatGPT, stressing the need for guidelines and research into how AI affects the research process [16] . They call for interdisciplinary studies on whether AI can produce valid research hypotheses or whether it might inadvertently propagate errors or biases. Such concerns echo the need for critical literacy at the highest levels of knowledge production: even journal editors and peer reviewers must be equipped to critically assess content in an era where parts of it might be machine-generated. Some top conferences and journals have already implemented reviewer checklists that include prompts like "If any portion of this manuscript appears AI-generated, assess its validity and originality." Kazakhstan, aiming to increase its research output and quality, will need to ensure its scholars and gatekeepers (e.g., editorial boards of local journals) are not left behind in these evolving competencies.

Another notable point of comparison is the language

factor. In Anglophone countries, AI tools are usually first developed for English and then extended to other languages. For Kazakh (and to a lesser extent Russian, which is widely used in Kazakhstan's academia), such tools may lag. There have been some efforts to create AI language models for Kazakh, but their capabilities (especially in academic writing) are currently limited. This means Kazakhstani educators have an extra hurdle: the most advanced AI literacy tools might not directly apply to the Kazakh language, potentially creating a digital divide. Internationally, similar issues arise for languages like Arabic or Hindi — researchers note that much of the AI training data is English-centric, which can affect the performance and reliability of AI outputs in other languages [17]. This is where a comparative lens is useful: sharing experiences across countries that also operate in less-resourced languages can lead to collaborative solutions (for example, developing AI writing support tools tailored to those languages or bilingual tools that handle code-switching contexts).

Finally, on an international policy level, organizations such as UNESCO have been advocating for a balanced approach to AI in education. The UNESCO Beijing Consensus on Artificial Intelligence in Education (2019) called for integrating AI in education in equitable and human-centric ways, emphasizing developing students' digital skills and safeguarding human intellectual contribution [18] . More recently, UNESCO (2023) issued guidance for policymakers on generative AI, recommending teacher training and updates to curricula to include critical AI literacy [19] . Kazakhstan, as a member of UNESCO, can draw from these frameworks to inform its national strategy, ensuring that critical literacy and ethics are front-and-center as AI tools become more commonplace in classrooms and research labs.

3.4. Challenges and Opportunities Identified

Across the reviewed literature and contexts, several recurring challenges and opportunities were identified regarding AI integration into critical literacy and academic publishing:

Language and Writing Quality

For many EFL scholars, AI offers an opportunity to improve the linguistic quality of their academic writing. Tools like automated grammar checkers or AI-based paraphrasing assistants can help non-native English writers meet international publication standards. The challenge, however, is ensuring that reliance on these tools does not diminish the writers' own language development. There is also the risk of AI tools introducing errors or non-standard phrasing that the author might not recognize. As one example, an AI translation might produce an awkward or slightly incorrect technical term; a researcher without strong proficiency might accept it blindly. Thus, an opportunity for Kazakhstan is to incorporate AI-assisted writing alongside English for Academic Purposes (EAP) training, so that scholars learn to critically review and revise AI outputs, effectively using them as learning aids [3,9] .

Critical Evaluation of Sources

AI tools can rapidly retrieve information, but not all of it is high-quality or relevant. The opportunity here is that AI can expose students to a broader range of sources (e.g., summarizing a body of literature quickly). The challenge is teaching students to be skeptical of those AI-curated sources. For instance, if ChatGPT provides a summary of a research topic with citations, students need the critical literacy skills to verify those citations (as AI might hallucinate references) and read the original sources for confirmation. This is a global challenge; even experienced researchers must be cautious. A positive development is the emergence of AI tools that assist in source evaluation — for example, tools that check the credibility of a cited website or analyze the sentiment and bias of a text. Using such tools, if available in languages of interest, could strengthen critical literacy. However, mastering these meta-tools is itself a learning curve.

Ethical and Legal Issues

There is an opportunity for educators to engage students in rich discussions about ethics in the digital age, using AI in academia as a concrete case. Questions such as "Is it acceptable to use AI to generate parts of a literature review?" or "Who owns the text that an AI produces?" do not have easy answers, but grappling with them builds critical thinking. The literature encourages involving students in creating honor codes or guidelines for AI use, as this fosters buy-in and deeper understanding [13,16]. The challenge is that the legal landscape (e.g., around intellectual property or data privacy when using AI platforms) is still evolving. For example, if a researcher in Kazakhstan uses an online AI platform to edit a draft, are they inadvertently sharing confidential data (the draft) with the AI provider? Critical digital literacy includes understanding terms of service and the implications of cloud-based AI tools.

Educators and institutions will need to develop clear advice on such matters. Encouragingly, some universities abroad have created "AI ethics committees" which include student representatives to continuously update usage policies — a model that could be emulated.

Resource and Training Gaps

Integrating AI into pedagogy requires resources (software, stable internet, etc.) and teacher training. Opportunity lies in international collaboration: Kazakhstan can benefit from adapting open-access AI literacy curricula developed elsewhere. The challenge is ensuring that teachers themselves have sufficient understanding and not an attitude of fear or prohibition toward AI. Palacios-Hidalgo and Huertas-Abril highlighted how the sudden shift to remote teaching during COVID-19 forced teachers to adapt to new technologies[20] . Similarly, the advent of AI could be a catalyst for teachers to upskill. Their study on future EFL teachers' competences suggests that exposure and positive training can change attitudes from apprehension to confident usage of educational technology. We foresee a need for professional development modules in Kazakhstan specifically addressing AI tools in academic writing and how to teach with them — an effort that could be led by universities and teacher-training institutes, possibly with support from international partners (British Council, Fulbright programs, etc., have an interest in supporting academic writing initiatives).

Maintaining Academic Standards

A persistent question is whether heavy use of AI will dilute the originality and critical depth of academic work. Students might be tempted to use AI to do the thinking for them, for example by generating an essay response which they then minimally tweak. This is a genuine concern raised in multiple sources[10,16] . On the flip side, when used appropriately, AI might free up time from mechanical tasks, allowing writers to focus more on the intellectual substance and critical analysis. A junior researcher might use an AI to handle tedious formatting or to generate a draft abstract, then spend more time refining the argumentation and evaluating content - arguably a better use of cognitive resources. The balance must be managed. Several studies recommend an instructional approach that explicitly teaches the stages of writing and research where AI is helpful versus stages where human insight is irreplaceable. For example, Godwin-Jones (2022) suggests partnering with AI for lower-order concerns (like grammar) while retaining human control over idea development and organization[19] . Such an approach, if communicated to students, can maintain academic standards and even raise them by reducing the burden of minor errors and allowing focus on deeper revision.

In summary, the results of this review depict a landscape of cautious optimism. AI tools are seen as beneficial in addressing some long-standing challenges in academic publishing (especially for non-native English users), yet they bring forth new challenges requiring a re-doubling of critical literacy efforts. The next section will discuss these findings in greater depth, connecting them back to the broader objectives and theoretical context, and exploring specific implications for stakeholders in Kazakhstan and comparable settings.

4. Discussion

The intersection of AI, critical literacy, and academic publishing in language education is a dynamic nexus where technological potential meets educational philosophy. The findings from our review illuminate how this interplay is unfolding and suggest nuanced answers to the guiding questions of this article.

4.1. AI as Amplifier of Human Potential — or Substitute?

A central discussion point is whether AI is being used as an amplifier of human capabilities or as a substitute for them. The literature and examples reviewed indicate that the answer lies in how stakeholders choose to integrate AI. In many positive cases, AI serves to amplify: Omani students using AI translators and checkers are still generating the ideas and content themselves, but leveraging AI to express those ideas more clearly. Similarly, a Kazakhstani scholar might use an AI-based literature recommendation system to discover papers she might have missed, thereby broadening her perspective (amplification of research breadth). These uses align with a vision of AI as a partner or tool under human direction — what some researchers call a "cyborg approach" to writing and reading, where the human-AI team outperforms what either could do alone[19] .

However, the risk of substitution is real. If a student lets an AI writing generator produce an entire essay and the

student merely touches it up, the AI has effectively taken over the core intellectual task. The student's critical thinking and writing skills do not develop — in fact, they may atrophy. This concern echoes the worries educators had when calculators became widespread: Will arithmetic skills decline? In that historical case, education adjusted by focusing more on conceptual problem-solving and less on manual calculation, acknowledging calculators as tools. By analogy, education in the AI age might shift to emphasize higher-order skills — crafting research questions, critically evaluating arguments — and less the lower-order skills that AI can handle (grammar, formatting, maybe even basic summary). The critical literacy component is then more crucial than ever: students must be taught to critically appraise AI outputs, to ask, "Does this sentence/argument actually make sense for my context? Is it true? Is it relevant?" instead of assuming the machine is always correct. In other words, AI can handle the form to an extent, but humans must govern the content and meaning. This distinction aligns with Sarsembayeva et al.'s view of AI-generated literature lacking authentic human experience — only a human reader or writer can imbue work with contextual meaning and ethical judgment.

For Kazakhstani academia, this means training scholars who use AI to remain in the intellectual driver's seat. One practical implication is the development of guidelines or frameworks at the institutional level: e.g., a university might create an "AI in Writing" handbook that outlines acceptable uses (proofreading, language polishing, data analysis assistance) and explicitly warns against uses that bypass learning (auto-generating entire drafts, etc.). This would clarify to faculty and students that the institution supports AI for amplification, not substitution. It also provides an opportunity to define academic integrity in the AI era — for instance, requiring that any AI assistance be acknowledged. From a critical literacy perspective, having to acknowledge AI use could prompt reflection: "What exactly did the AI do for me, and why did I need that help?" Such metacognitive questions enhance one's awareness of one's own strengths and weaknesses in academic skills.

4.2. Language Equity and AI — Bridging the Gap or Widening It?

A significant discussion theme is the role of AI in addressing language equity in academic publishing. English dominates as the lingua franca of academia, which has disadvantaged scholars from non-English backgrounds, including many in Kazakhstan. On one hand, AI tools offer a bridge: machine translation and writing aids can help scholars translate their findings into English and potentially reduce the language barrier that might prevent good research from being published internationally. Curry and Lillis have long documented how proficient English writing is a gatekeeping factor in global knowledge production[21] . If AI can help democratize that, it's a win for inclusivity. There are already success stories: a researcher fluent in their domain but not in English can use AI translation, then have a bilingual colleague or editor refine it, enabling their work to reach a global audience where previously it might have remained local. From our FLS sources, Qoyyimah (2023) directly addressed how translating data and reports into English is an "invisible" yet crucial step for non-Anglophone researchers, highlighting that many important findings need this extra bridge to enter international discourse[22] . AI could make that step less daunting and less costly (many currently rely on professional human translators or spend inordinate time learning to write like a native speaker).

On the other hand, there is a paradox: if everyone uses similar AI tools, will academic writing become more homogenized, potentially dulling the diverse voices in scholarship? One might argue that unique cultural or rhetorical styles could be lost if, say, every paper gets edited by the same AI which enforces a certain pattern. Additionally, English-trained AIs might inject Anglocentric biases or examples that are not culturally relevant to Kazakhstan. The discussion around AI and critical literacy thus includes maintaining voice and perspective. Educators should encourage scholars to use AI to clarify their expression, but still to assert their unique viewpoint and context. As an example, a Kazakhstani researcher writing about local language pedagogy might use AI to fix grammar but should ensure that local concepts (e.g., the significance of trilingual education policy or a Kazakh term with no direct English equivalent) are preserved and explained, rather than omitted because the AI doesn't recognize them. This ties back to critical literacy: understanding which parts of your text might not be understood by an AI (or by international readers) and then consciously deciding how to present them. In this regard, AI becomes a test audience — if an AI translator fails to translate a term properly, that signals

the author to provide more context or choose a different way to convey the idea.

From a policy standpoint, the discussion about language equity suggests that international bodies and publishers could support AI development for less-resourced languages. It also suggests that critical literacy education include an element of critical language awareness. In Kazakhstani universities, where courses might be taught in Kazakh, Russian, or English, students could benefit from tasks that involve moving between languages with AI as a helper, and then critically reflecting on the changes. For example, have students write a short research reflection in Kazakh, use an AI to translate to English, and then discuss in class what was lost or changed in translation. This exercise could sharpen awareness of linguistic nuances and encourage students to critically evaluate AI's handling of culturally specific content.

4.3. Preparing Educators and Students for an AI-Enhanced Academia

A major discussion point is how to prepare stakeholders—both educators and students—for the ethical and effective use of AI in academic contexts. Many sources highlight training and policy as key. Our comparative results showed that in higher-resourced contexts there are already numerous initiatives (workshops, policy drafts, etc.)[10,13,16] . In Kazakhstan, it may be beneficial to initiate a national dialogue or conference on "AI in Higher Education and Research" involving the Ministry of Education, universities, and student representatives. The aim would be to exchange experiences (perhaps some faculty have success stories or cautionary tales using AI in teaching), and to start drafting guideline templates. This could mirror what some UK universities did in 2023 by sharing their internal policies openly.

Educators themselves need expanded professional development. A language teacher who is expected to cultivate critical literacy must first feel confident in understanding AI text generation and detection. Without this, the default reaction might be fear or prohibition, which doesn't help students learn to navigate these tools responsibly. As noted by Palacios-Hidalgo and Huertas-Abril[20] , sudden transitions (like the move to online teaching in 2020) can leave teachers on the back foot. The introduction of AI need not be sudden if addressed proactively. Teacher training programs (pre-service) in language education should now include components on digital literacies, including AI. For current in-service teachers, short courses or modules can be introduced. For example, a module could involve teachers using an AI to grade some sample papers or to generate exercises, then discussing what the AI did well or poorly. This mirrors research from other countries where teachers who played with AI tools themselves later felt more comfortable guiding students[13] .

From the student preparation side, incorporating AI into curricula might seem counterintuitive (why give them a tool that could facilitate cheating?). But research in educational technology often shows that banning rarely works (tech finds its way in) and it's better to channel the use. A forward-looking approach might be: in a research methods or academic writing course, have an assignment where students must use an AI writing assistant to improve a draft, and then submit a reflective commentary on how the AI changed their text and whether those changes were truly improvements. This not only demystifies AI but also directly exercises critical literacy: students compare versions, evaluate clarity, detect any AI-introduced errors, etc. Such an assignment turns AI into a pedagogical tool rather than a shortcut. Early evidence from classroom experiments (anecdotally reported in forums and early teacher reports) suggests students are quite astute in noticing that AI can sometimes make arguments sound formulaic or "too general," and they often point out the need for their personal examples or voice. This is a sign that with guidance, students can learn the limitations of AI and not blindly trust it.

4.4. Global Collaboration and Knowledge Sharing

The challenges and opportunities we discuss are global in nature. One beneficial discussion point is the value of international collaboration in tackling these issues. Researchers in different countries are investigating overlapping questions (as seen by the diversity of contexts in FLS publications and others). There is an opportunity for Kazakhstani educators and researchers to contribute to and learn from this global knowledge pool. For instance, Central Asian perspectives on multilingual education and how AI can assist might add valuable insights to global discussions that have so far been

dominated by Western or East Asian viewpoints. Conversely, Kazakhstan can adapt successful strategies tried elsewhere: e.g., the "zero draft" technique (where a student uses AI to produce a rough draft and then fully rewrites it in their own voice) is one being discussed in some US writing centers as a compromise approach to allow AI but ensure learning. Such pedagogical innovations could be tested in Kazakhstani universities.

International journal forums (like *Forum for Linguistic Studies*, which includes articles from various countries) could be venues for publishing case studies from Kazakhstan, thereby raising the profile of Kazakhstan's adaptation efforts. Also, initiatives like the mentioned international conference on innovations in linguistics and language education show that the region (e.g., Uzbekistan in that case) is organizing events on global trends and local perspectives. Participating in these will help ensure that Kazakhstan's approach to AI in critical literacy is informed by cutting-edge debates and that its unique context is represented.

In conclusion to this discussion, it becomes clear that integrating AI into critical literacy practices is not a binary good-or-bad proposition; it is a complex process requiring intentional strategies, critical awareness, and ethical guardrails. The discussion underscores that the human element—educators' guidance, students' agency, researchers' curiosity—remains at the heart of critical literacy, even as AI becomes more prevalent. The technology might change the tools we use and the skills we emphasize, but the fundamental goals of education (developing informed, critical, creative thinkers and writers) remain constant. Kazakhstan's journey in this realm will likely echo global patterns with local inflections: balancing global English-centric academic norms with local multilingual realities, harnessing AI for inclusion while safeguarding academic integrity, and ultimately, preparing the next generation of scholars to thrive in a world where human and artificial intelligence coexist in the creation and interpretation of knowledge.

5. Conclusions

The integration of artificial intelligence into academic publishing and language education is an evolving reality that carries significant promise as well as challenges. This review has examined how AI tools can support critical literacy practices—specifically, the ability of educators and students to critically read, write, and think about academic texts—in the context of Kazakhstan and in comparison with international experiences. Several key conclusions and implications emerge from our analysis:

AI as a Supportive Tool for Academic Writing

AI-based writing assistants and translation tools can substantially aid scholars and students, particularly those writing in a second language, by improving the clarity, accuracy, and efficiency of academic writing. Empirical evidence from multiple contexts indicates positive outcomes, such as improved writing fluency and confidence, when AI is used for tasks like grammar checking, idea generation, and translation. In Kazakhstan, where many researchers and graduate students must publish in English, these tools offer a way to bridge language barriers. However, it is crucial that AI remains a support, not a crutch. Over-reliance without understanding can lead to complacency and erosion of the writer's own skills. Therefore, academic programs should integrate AI tool usage with instruction on writing conventions and rhetorical skills. In practice, this might mean teaching students how to use Grammarly or a translation program to polish a draft, and equally how to critically review the suggestions it provides, thus learning from the tool. The use of AI should be framed as part of the writing process that still requires human oversight and critical decision-making at each step.

Maintaining and Strengthening Critical Literacy

The core of critical literacy—questioning and analyzing texts—becomes even more vital in the age of AI. Students and educators must extend their critical faculties to interrogate not only human-authored texts but also AI-generated content. This includes recognizing potential biases (e.g., an AI trained predominantly on Western texts might carry those perspectives) and verifying information rather than accepting it at face value. The concept of authorship also becomes multifaceted; as AI contributes to writing, the human author's role shifts towards being a curator and editor of content. We conclude that curricula in language education need updating to include modules on AI and media literacy. For example, assignments could involve comparing an AI summary to the original source or identifying differences between AI-generated and human-generated arguments. By explicitly teaching these skills, educators can help students

develop a skepticism that is nuanced—not a dismissal of AI outputs outright, but a habit of cross-checking and thoughtful engagement. The end goal is that graduates will be adept at using new technologies while remaining sharply critical of the information those technologies produce or retrieve. Encouragingly, if cultivated, these habits will serve students beyond academia, preparing them as citizens who can navigate a world of deepfakes, algorithm-curated news, and other AI-mediated information sources.

Ethical and Policy Frameworks are Urgently Needed

Our review highlights a lag between the technological capabilities of AI and the policies governing its use in educational settings. This is true globally and in Kazakhstan. Instances of AI misuse (such as undisclosed AI-generated essays or fabricated data) pose threats to academic integrity. It is imperative for educational institutions and publishers to establish clear guidelines on AI. These should address questions such as: What constitutes acceptable use of AI in writing a thesis or a journal article? How should AI assistance be acknowledged? What are the consequences for misrepresenting AI-generated work as one's own? Some leading journals and universities have issued initial guidelines (e.g., disallowing AI as a credited co-author, requiring disclosure of AI tools used)[10,16] , which can serve as templates. For Kazakhstan's context, national bodies like the Ministry of Education and Science, as well as university academic councils, should proactively convene experts (including linguists, AI specialists, ethicists, and student representatives) to formulate policies. These policies need to be coupled with awareness campaigns so that students and faculty know them. Notably, an ethical framework must also consider equity—for example, if AI premium services are used (which cost money), does that advantage some students over others? Perhaps institutions should provide access to approved AI tools to ensure equal opportunity. Additionally, issues of data privacy (sending students' work to third-party AI services) need attention. In sum, a comprehensive policy approach will safeguard academic standards while embracing the positive potential of AI. Encouragingly, local educators are actively exploring ways to cultivate ethical AI usage in language teaching[23] , underscoring the importance of building these competencies into policy.

Training and Continuous Development

The successful integration of AI into critical literacy practices hinges on the preparedness of educators. This review found that while students are often quick to adopt new technologies, teachers may be unsure how to respond, oscillating between outright bans and uncritical acceptance. To navigate a balanced path, instructors need training that builds their own digital competence and pedagogical strategies for AI. We recommend that teacher education programs (both pre-service and in-service) include components on leveraging AI in teaching writing and research skills. Workshops or courses can demonstrate, for instance, how to use AI to generate multiple examples of a text that students can then critique, or how to detect AI-generated material and use that as a teaching moment about the quality of arguments. For higher education faculty, centers for teaching excellence could offer seminars on rethinking assignment design in light of AI—for example, designing essay prompts that require personal reflection or the application of local context, which an out-of-the-box AI is less capable of supplying, thus ensuring students must do meaningful work. The overall aim of such professional development is to empower educators to guide students in ethical, effective, and critical use of AI, rather than leaving students to figure it out by themselves (or misuse it). Our comparative analysis suggests that countries moving fastest in productive AI adoption are those investing in teacher capacity-building. Kazakhstan stands to benefit greatly from following suit, perhaps in collaboration with international partners who can share resources and expertise on AI in education. Notably, initial local studies have begun examining AI tools in educational settings—for instance, the impact of an AI writing assistant on high school students' writing confidence and academic integrity[24–26] —indicating growing attention across education levels.

Future Research and Continuous Monitoring

This review also brings to light the need for ongoing research and monitoring of AI's impact. The landscape is rapidly changing—for instance, AI models are improving, and their use will likely grow. It will be important to empirically study outcomes: Does the use of AI writing tools measurably improve students' writing over a semester? How does the presence of AI influence the way students approach sources and evidence in their papers? Are there any negative effects on critical thinking or originality? In the Kazakhstani context, research could examine how bilingual

or trilingual students use AI differently in each language. Additionally, there is room for exploratory studies on attitudes: understanding what teachers and students feel about AI's role could guide better policy. On a larger scale, longitudinal studies might be needed to see how critical literacy skills evolve for a cohort that has always had AI assistance available. We encourage researchers in applied linguistics and education technology in Kazakhstan and elsewhere to take up these questions. The findings will help recalibrate educational approaches continuously. In this sense, the integration of AI is not a one-time implementation but an ongoing process requiring feedback loops between practice and research.

In conclusion, the integration of AI into critical literacy practices related to academic publishing in language education is both inevitable and manageable. Kazakhstan, like all countries, will need to navigate this transformation. By learning from global experiences and prioritizing a human-centered approach—where AI is a tool serving pedagogical goals and not vice versa—stakeholders can ensure that the result is a net gain: greater access to academic discourse, enhanced support for learning, and preserved integrity and depth of scholarly work. The key lies in preparation, critical engagement, and an unwavering commitment to the educational values of curiosity, integrity, and empowerment that no machine can replace.

Author Contributions

Conceptualization: M.J., G.Y.; Literature Search and Data Curation: M.J. (lead on international literature), G.Y. (lead on Kazakhstan–specific sources); Methodology: Z.Z., G.Y. (contributed to design of comparative analysis); Writing – Original Draft: M.J. (drafted Sections 1–3), A.A. (drafted Sections 4–5 and integrated revisions); Writing – Review & Editing: M.J. and G.Y. (critical review of all sections, refinement of arguments, language editing); Visualization: G.Y. (prepared Table 1 and coordinated its content); Supervision: M.J. (oversaw the project, provided guidance on focus and structure). All authors have read and approved the final manuscript, and all agree to be personally accountable for their contributions and for ensuring that any questions relating to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Institutional Review Board Statement

Ethical review and approval were waived for this study because it is a review article that synthesizes previously published literature and publicly available data; no new data were collected, no human participants or animals were involved, and no identifiable personal information was accessed, placing it outside the remit of institutional ethics oversight.

Informed Consent Statement

Not applicable.

Data Availability Statement

No new data were created or analyzed in this study. Data sharing is not applicable to this article as it is a review of previously published literature.

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Conflict of Interest

The authors declare no conflict of interest.

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