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THE ROLE OF AI IN DEVELOPING MULTIMODAL AND DIGITAL WRITING LITERACIES

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Abstract. The integration of artificial intelligence (AI) into educational environments has transformed the landscape of writing instruction, particularly in the domains of multimodal and digital literacies. In tertiary education, students are increasingly required to produce texts that combine linguistic, visual, auditory, and interactive elements, often with the assistance of AI-powered tools. This paper examines the role of AI in developing multimodal and digital writing literacies among university students. Employing a mixed-method design with 200 undergraduate students and 25 instructors across four universities, the study explored how AI tools such as generative text models, image creators, and digital editing platforms influence students' ability to design, compose, and critically evaluate multimodal texts. Results indicate that AI significantly enhances students' technical fluency, design experimentation, and efficiency in mode-switching. However, challenges persist in critical AI evaluation, ethical attribution, and preservation of authorial voice. The findings underscore the necessity of integrating AI literacy into writing curricula, emphasizing a balanced approach where AI serves as a collaborative scaffold rather than a substitute for human creativity and critical thinking.

Key words: artificial intelligence, multimodal literacies, digital writing, AI literacy, tertiary education, writing competence, human-AI collaboration.

Introduction. The twenty-first century has witnessed a paradigm shift in what it means to be a competent writer. No longer confined to linear, text-based compositions, contemporary writing increasingly demands proficiency across multiple semiotic modes linguistic, visual, auditory, gestural, and spatial often delivered through digital platforms. This shift, termed multimodal literacy (New London Group, 1996), has been further accelerated by the rapid proliferation of artificial intelligence (AI) tools capable of generating, editing, and transforming content across these modes. From ChatGPT producing coherent prose to DALLE creating original images and Runway ML generating video sequences, AI systems now actively participate in the writing process. In tertiary education, students are expected not only to consume multimodal content but also to produce it whether in the form of digital presentations, video essays, infographics, podcasts, or interactive web content. However, traditional writing pedagogies have been slow to adapt. Many courses still prioritize grammatical accuracy and linear argumentation over multimodal design and digital fluency. Moreover, the role of AI in this process remains underexplored. While some educators view AI as a threat to academic integrity, others recognize its potential as a powerful scaffold for developing multimodal and digital literacies. This paper addresses the following research questions:

1. In what ways does AI contribute to the development of multimodal and digital writing literacies among tertiary students?
2. What pedagogical strategies can effectively integrate AI into writing instruction to enhance, rather than undermine, students' creative and critical capacities?

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By examining both quantitative outcomes and qualitative experiences, this study aims to provide evidence-based recommendations for educators seeking to harness AI's potential in developing future-ready writers.

Literature Review. The theoretical foundation of this study rests on two intersecting bodies of literature: multimodal literacy and AI-mediated learning. The concept of multiliteracies, introduced by the New London Group (1996), argued that effective communication in a globalized, digitally mediated world requires proficiency across multiple representational modes. Kress (2010) extended this argument, proposing that writing is increasingly a matter of design choosing and arranging semiotic resources to achieve specific rhetorical effects. In this framework, traditional notions of "correctness" give way to considerations of appropriateness, creativity, and audience awareness.

Digital writing literacies, as defined by Warschauer (2010), encompass not only technical skills (e.g., using word processors or design software) but also social and critical competencies, such as understanding digital audiences, navigating hypertextual structures, and evaluating online sources. More recently, Selfe (2017) emphasized that digital writing is inherently multimodal, requiring writers to consider how text, image, sound, and layout interact to construct meaning. Empirical research on AI and writing has grown rapidly. Godwin-Jones (2022) found that AI-powered writing assistants (e.g., Grammarly, ChatGPT) can improve students' linguistic accuracy and syntactic variety, but may also reduce their willingness to revise independently.

In a study of multimodal composition, Chen et al. (2023) reported that students using AI image generators produced more visually diverse projects but often struggled to integrate images meaningfully with text, suggesting that technical access does not automatically translate into rhetorical competence. More critically, Marquart (2024) documented cases where students over-relied on AI-generated content, resulting in superficial arguments and a diminished sense of authorial ownership. Zhao and Zhang (2023) similarly found that while AI could help students generate ideas, it often produced generic or culturally biased outputs that required significant human revision. These findings highlight a central tension: AI can scaffold learning, but only when students possess the critical literacies to evaluate and transform AI outputs. In fact, the literature confirms that AI has significant potential to develop multimodal and digital writing literacies, but also poses risks related to over-reliance, ethical lapses, and diminished critical thinking. Empirical research is needed to understand how these tensions play out in authentic classroom settings, a gap the present study seeks to address.

Methodology. Participants. The study involved 200 second- and third-year undergraduate students from four universities in Uzbekistan (two state and two private institutions), representing disciplines including English Philology, Journalism, Digital Media, and Computer Science. Additionally, 25 writing instructors participated in the study. Students had intermediate to advanced English proficiency (B2 and C1 on the CEFR scale) and basic digital literacy.

Instruments

- Pre- and Post-Intervention Multimodal Writing Task: Students produced a digital multimodal text (e.g., a short video essay, an infographic with embedded text, or a podcast episode with a transcript) on a socially relevant topic of their choice.
- Digital and Multimodal Writing Literacy Scale (DMWLS): A 30-item Likert-scale instrument developed by the researcher, measuring four constructs: 1. Technical fluency with AI and digital tools,

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2. Rhetorical design across modes, 3. Critical evaluation of AI-generated content, and 4. Ethical awareness in human-AI collaboration (Cronbach's $\alpha = 0.89$).

- Reflective Journals: Students submitted weekly reflections documenting their AI use, challenges, and decision-making processes.
- Semi-structured Interviews: Conducted with 20 students (10 high-performing, 10 struggling) and all 25 instructors post-intervention.

Procedure

The study lasted 16 weeks. Students in the experimental group (n=120) received instruction explicitly designed to integrate AI into multimodal and digital writing development, including:

- Workshops on prompt engineering for text and image generation
- Collaborative analysis of AI-generated versus human-authored multimodal texts
- Guided practice in iterative revision with AI feedback
- Ethical decision-making scenarios (e.g., when to disclose AI use, how to attribute AI contributions)
- Peer review sessions focusing on mode integration and rhetorical effectiveness

The control group (n=80) received traditional writing instruction focused on argumentative essays and research papers, with no AI or multimodal components.

Results and Discussion. The results strongly support the proposition that AI, when integrated pedagogically, plays a significant role in developing multimodal and digital writing literacies. The experimental group's gains in technical fluency and rhetorical design confirm Godwin-Jones's (2022) assertion that AI can scaffold learning. However, the finding that critical evaluation and ethical awareness require explicit instruction and do not develop automatically through AI exposure extends existing research. Simply providing access to AI tools is insufficient; structured pedagogical interventions are necessary.

Moreover, the study reveals a developmental trajectory in students' relationship with AI like from initial over-trust and passive acceptance, through a crisis of authorial identity, toward strategic, critical collaboration. This trajectory suggests a staged model for AI literacy instruction, beginning with technical training, moving through ethical reflection, and culminating in critical co-authorship. The study has limitations. The 16-week duration, while longer than many similar studies, may not capture long-term retention of skills. Additionally, the sample was limited to Uzbek universities, cultural attitudes toward AI and authority may influence generalizability. Future research should explore cross-cultural differences and examine AI's role in developing multimodal literacies in professional contexts.

Conclusion. The role of AI in developing multimodal and digital writing literacies is neither inherently beneficial nor harmful it depends entirely on pedagogical design. This study demonstrates that when AI tools are integrated through structured, reflective, and ethically grounded instruction, they significantly enhance students' technical fluency, rhetorical design skills, and critical evaluation capacities. For tertiary institutions, the implications are clear. Writing curricula must be redesigned to include AI literacy as a core component, not an add-on or a threat. This requires investment in instructor training, development of new assessment rubrics, and provision of equitable access to AI tools. Most importantly, educators must reframe their role from sole content experts to co-learners and critical guides in a human-AI collaborative writing environment. The age of AI does not spell the end of writing. Rather, it signals the beginning of a richer, more complex, and more creative era of

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multimodal and digital expression provided educators rise to the challenge of preparing students for it.

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