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THE USE OF WEB TOOLS IN EDUCATION: A CASE STUDY IN A SECONDARY SCHOOL IN MONTENEGRO

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Abstract: This review examines the role of web-based tools in contemporary education by integrating recent research (2020–2025) and illustrating practice through a survey of 120 teachers at a secondary school in Montenegro. After outlining the evolution of the web (from Web 1.0 to Web 3.0) and key categories of educational tools (learning management systems, collaboration platforms, video-conferencing, game-based quiz systems, social media), we synthesize findings from recent systematic reviews and empirical studies. These show that digital tools generally have positive effects on student engagement, motivation, conceptual understanding, and academic performance, provided they are integrated purposefully and supported by infrastructure and teacher training. In our school-level survey, teachers reported intensive use of Microsoft Teams, PowerPoint, YouTube, and messaging apps (Viber/WhatsApp), alongside growing interest in interactive platforms such as Kahoot. They expressed mainly positive attitudes toward web tools, but also noted challenges related to technical issues, workload, and unequal student access. Taken together, the literature and case findings indicate that web tools are now integral to teaching, yet their success depends on pedagogically informed design, teacher digital competence, institutional support, and attention to equity and privacy. The paper concludes with implications for practice and proposes directions for future research on the pedagogical and organizational conditions that sustain and make technology integration effective.

Keywords: web tools; educational technology; e-learning; digital literacy; information and communication technology (ICT); Web 2.0; Web 3.0.

Introduction

The widespread availability of the internet and web-based applications has transformed how learning is organized and experienced at all levels of education. Digital technologies now serve as knowledge providers, co-creators of information, mentors, and assessors, reshaping not only content delivery but also interaction patterns and assessment practices (Haleem et al., 2022). The COVID-19 pandemic accelerated this trend, forcing schools and universities worldwide to adopt online or hybrid teaching and thereby institutionalizing the use of learning platforms, video-conferencing tools, and interactive web applications.

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Despite rapid adoption, there is still a need to systematically synthesize how web tools are used in practice, the benefits they provide, the limitations they entail, and the conditions under which they contribute to better learning outcomes. Recent reviews and empirical studies suggest that digital tools can increase engagement, support active and collaborative learning, and improve performance, but also highlight persistent challenges such as digital divides, workload, and the need for teacher training (Miras et al., 2023; Osorio Vanegas et al., 2023). However, challenges remain, including unequal access to technology, increased teacher workload, and the need for sustained professional development (Al-Maroof et al., 2021; Haleem et al., 2022; Sobaih et al., 2021).

The goals of this paper focus on:

- Conceptualizing web tools and summarizing their main categories and functions in teaching and learning.
- Integrating findings from recent research (especially 2020–2025) on their impact on student outcomes and teaching practices.
- Illustrating these issues through a small case study: a survey of 120 teachers from a Montenegrin secondary school.
- Discussing implications for practice and outlining concrete directions for future research.

Theoretical Background

From Web 1.0 to Web 3.0 in Education

Web technologies have evolved through distinct phases. **Web 1.0** (circa 1990s) featured static pages and one-way information delivery; educational use was mainly posting syllabi or course materials online. **Web 2.0** introduced interactivity and user-generated content. Tools like blogs, wikis, social media, and video sharing enabled students and teachers to interact, collaborate, and co-create content. This participatory era supports constructivist learning: for example, student-run blogs and class wikis foster peer learning and reflection. Studies on Web 2.0 use in language teaching and project-based learning report that these tools can enhance learner-centered collaboration and critical thinking when aligned with pedagogy (Fathian et al., 2023).

More recently, attention has turned to **Web 3.0**, also known as the "Semantic Web," which involves intelligent, data-driven, AI-supported environments. In education, this manifests as adaptive learning platforms, AI tutoring, and sophisticated analytics. Systematic reviews have noted increased use of AI-driven features—such as automated feedback, virtual labs, and intelligent tutoring systems—in higher education and K–12 settings. For instance, Wang and Fan (2025) found that integrating AI chatbots (e.g., ChatGPT) into learning yielded large improvements in student academic performance and moderate gains in motivation and higher-order thinking (Zhang et al., 2025). These AI tools represent the cutting edge of Web 3.0 in education: by processing natural language and individual learning data, they offer personalized support and new forms of engagement.

Categories of Web Tools

Educational web tools are often categorized by function:

- **Learning Management Systems (LMS):** Platforms like Moodle, Google Classroom, and Canvas organize course materials, assignments, discussions, and grading. Research shows Moodle is highly customizable with rich pedagogical features, whereas Google Classroom is simpler and more intuitive for quick deployment. For example, comparative studies indicate that Moodle's advanced assessment and activity modules can support complex teaching strategies, while Google Classroom offers seamless integration with Google Docs and easy setup, favored in rapidly shifting online environments (Kreijns et al., 2024; Adhikari et al., 2024).
- **Collaboration Platforms:** Systems such as Microsoft Teams, Google Workspace, and Slack integrate file sharing, chat, and conferencing. During the pandemic, Microsoft Teams was widely adopted in higher education. Sobaih et al. (2021) report that students found Teams effective for accessing learning resources and collaborating with peers, leading to generally positive learning experiences[2]. However, they also noted issues like limited teacher support and low participation when courses lacked structured activities. These findings echo our case, where teachers use Teams heavily for content and communication, but express concerns about sustained engagement.
- **Video Conferencing Tools:** Applications like Zoom, Teams Meetings, and Webex enable live virtual classes. Research suggests that combining these synchronous tools with active pedagogies (e.g. breakout rooms, polls) can approximate face-to-face interaction and maintain student satisfaction. Conversely, long hours on video can cause "Zoom fatigue" and technical issues (Al-Maroof et al., 2021). Effective practice requires interactive design: simply lecturing online tends to reduce engagement unless supplemented with collaborative tasks.
- **Game-Based Response Systems (GSRS):** Platforms such as Kahoot!, Quizizz, and Socrative support gamified quizzes and polls. A comprehensive meta-analysis by Özdemir (2024) synthesized 43 experimental studies on Kahoot! and found moderate to large positive effects on student outcomes. Specifically, Kahoot! significantly improved academic achievement, retention, and motivation, and also reduced anxiety, compared to traditional instruction. These systems are most effective when used regularly for formative assessment and integrated with course objectives. If overused as mere entertainment, their benefits tend to wane.
- **Social Media and Web 2.0 Tools:** Blogs, wikis, social networks (Facebook, Twitter, etc.), and multimedia platforms (YouTube, podcasting) enable collaborative content creation and communication. Systematic reviews (Pérez et al., 2023) show social media can be an engaging method of teaching and learning. For instance, studies in language education found that student-operated YouTube channels and class Facebook groups can improve digital literacy, presentation skills, and peer learning. In higher education, instructors increasingly exploit social networks for announcements and group projects. However, effective use of these tools typically requires explicit pedagogical structuring and attention to privacy and digital citizenship.
- **Assessment and Survey Tools:** Online quiz and survey builders (e.g., Google Forms, Microsoft Forms) are widely used for low-stakes assessments, polls, and course evaluations. In our survey, many teachers used Forms for quick quizzes and feedback. These simple tools support agile checks of understanding and data collection[4]. However, by themselves they are lightweight – their pedagogical value depends on how thoughtfully questions are designed and results are acted upon.

Evidence on the Impact of Digital Tools

Recent large-scale reviews have converged on several themes regarding educational technology. Haleem et al. (2022) review the role of digital technologies globally and emphasize that properly integrated tools can improve student engagement, collaboration, and access to learning (Van Zanten et al., 2022). They note, however, that these benefits are contingent on factors like infrastructure quality, teacher readiness, and equitable access. In fact, another systematic review found that digital tool use has large positive effects on engagement, conceptual understanding, and performance across subjects—but again only under purposeful teacher facilitation. Tools alone do not guarantee learning; how they are integrated matters most.

Specifically, controlled studies of Kahoot! and similar GSRS consistently report positive outcomes. A prior meta-analysis already concluded that Kahoot! boosts performance, classroom dynamics, and motivation, while easing anxiety. Özdemir's (2024) update reinforces this: out of 43 studies, Kahoot! yielded moderate-to-large effect sizes for achievement, motivation, and retention. Our teachers' reports of greater student enthusiasm with Kahoot! align with this evidence.

For LMS platforms, surveys and usage data indicate that nearly all university courses now involve an LMS. Learners appreciate LMSs for course organization and timely feedback, and research notes widespread adoption of Moodle and Google Classroom. However, meta-analyses suggest that instructors often underutilize advanced LMS features unless they receive training and support. For example, although Moodle offers complex quiz branching and analytics, many teachers stick to simple file-sharing due to time constraints. This observation matches our case study: teachers rely on Teams (integrated with Office 365) as a hub, but typically use it in straightforward ways rather than exploring every feature.

Social media tools receive mixed reviews. Pérez et al. (2023) conclude that social networking sites can be attractive learning environments and have demonstrated potential for collaboration and information sharing. Indeed, some students engage more when given assignment options involving videos or collaborative wiki writing. Yet other studies caution that incorporating social media raises concerns (distraction, privacy, unequal familiarity) and often lacks a solid pedagogical theory. In practice, we find our teachers generally use YouTube as a video resource for instruction, rather than assigning students to produce their own content. This "consumption over creation" pattern is noted in broader research on Web 2.0 use, which shows content-production activities require more teacher scaffolding (Fathian et al., 2023).

In summary, the literature suggests that when educators intentionally align web tools with curriculum goals—supported by training and infrastructure—students tend to be more active, collaborative, and motivated (Van Zanten et al., 2022). These positive effects have been documented in meta-analyses of game-based learning, flipped classrooms, and AI assistants. At the same time, issues such as unequal internet access, teacher workload, and superficial use of technology are recurring themes in recent reviews (Miras et al., 2023; Osorio Vanegas et al., 2023). We turn now to our study methods and case findings, which explore these dynamics in a specific school context.

Methods

This paper conducted a literature review combined with a small empirical case study. We conducted a literature review (2020–2025) on web tools in education, focusing on systematic reviews and empirical studies. Key searches covered terms like "educational technology," "LMS in education," "game-based learning," and "ChatGPT education." We prioritized systematic reviews, meta-analyses, and empirical studies with clear methods and reported outcomes.

We also drew on data from an online survey conducted in April 2025 among teachers at a secondary school in Montenegro. A total of 120 teachers responded (a high proportion of the staff), providing information on:

- Tools they use (for teaching, communication, and administration)
- Their attitudes toward digital tools
- Perceived advantages and limitations
- Interest in experimenting with new platforms

The survey was administered via an online form and analyzed descriptively (frequency counts, percentages) and qualitatively (open-ended comments). While the sample is small and context-specific, the findings offer illustrative insight into how web tools are used in practice in a secondary school setting.

The Results section integrates insights from both the literature and the teacher survey.

Results

Global Web Infrastructure and Access

Educational use of web tools is built on infrastructure dominated by a few core technologies:

- **Web browsers:** Recent industry data show that Google Chrome holds roughly two-thirds (~66%) of the global browser market, followed by Apple's Safari (~17%), with Edge, Firefox, and others making up smaller shares.
- **Search engines:** Google controls about 89–90% of the global search engine market, with Bing, Yandex, Yahoo, and DuckDuckGo sharing the remainder.
- **Most visited sites:** Global rankings place Google and YouTube at the top, followed by Facebook, Instagram and, more recently, AI platforms like ChatGPT.

These data suggest that most students' and teachers' first contact with online educational resources happens through Google (search and YouTube) using Chrome, which has implications for information literacy (e.g. search skills, algorithmic curation).

Common Educational Web Tools (Literature Synthesis)

LMS (Moodle, Google Classroom, Canvas): Comparative studies find Moodle often wins on advanced features (quiz logic, conditional activities, detailed grade books) whereas Google Classroom wins on ease of use and seamless integration with Google Docs. For example, one study noted that Moodle's flexibility suits complex courses, but teachers found Google Classroom simpler to adopt without training. Our teachers reported using Teams/Office 365 primarily, with only a few using Moodle or Google Classroom. They appreciated any LMS that automated grade-taking and provided deadlines. In line with

the literature, our case suggests advanced LMS functions are underused unless a school mandates training and a clear policy for LMS use.

Microsoft Teams: During and after the pandemic, Teams became a central platform. Surveyed teachers relied on Teams for sharing materials, setting assignments, and holding live or hybrid classes. This matches findings by Sobaih et al. (2021), who observed that students found Teams effective for accessing resources and collaborating. Teachers here liked its integration with Office 365 and classes' "Teams space." However, consistent with the literature, they noted some issues: for instance, students seldom turned on cameras in online discussions, limiting social presence. This echoes Sobaih's report of low peer participation in poorly structured online courses. A few teachers also felt overwhelmed by frequent updates to Teams and Office apps, highlighting the need for ongoing training and tech support.

Game-based platforms (Kahoot!, Quizizz): A foundational meta-analysis by Özdemir (2024) confirms that Kahoot!, when embedded as a formative assessment, produces significant gains in student achievement, retention, and motivation. Our survey showed several language and social science teachers using Kahoot! regularly for review quizzes; they observed notable increases in student enthusiasm and recall. Respondents warned, however, that using Kahoot! too frequently (or as mere "fun time") could reduce its impact. These practical insights align with evidence that gamified quizzes work best when balanced with instruction and not used to replace genuine learning activities.

Web 2.0 tools & Social media: Systematic reviews indicate that blogs, wikis, and video-sharing can enrich learning through student production of content and peer feedback. k[4]This suggests Web 2.0 is largely consumed, not produced, in practice. Literature notes this consumption–production gap: without structured assignments, students default to passive use of social media. Some teachers mentioned informal use of social apps (Viber/WhatsApp) to coordinate among themselves or with parents, but none used social media formally for instructionk (Fathian et al., 2023).

Case Study: Teacher Use of Web Tools at Secondary School in Montenegro

The survey conducted during April 2025 revealed these patterns:

- **Core tools:** Microsoft Teams is the central tool for distributing materials, communicating with students, and organizing online or hybrid classes. Office 365 applications (Word, Excel, PowerPoint) are heavily used for creating lessons, managing grades and administrative documentation. YouTube is widely used to supplement lessons (especially in science and languages). The MEIS (national electronic student record system) is used for attendance and grading, though some teachers note usability issues.
- **Interactive tools:** Nearly half the teachers use Kahoot! or similar platforms for student quizzes. A few use Google Forms for quick polls or surveys. Notably, none reported using forums, wikis, or video-project assignments.
- **Communication:** Teachers communicate informally via Viber and WhatsApp (e.g. for last-minute schedule changes). A few teachers have created social media groups (Facebook/Instagram) for school events, but these are peripheral to instruction.
- **Attitudes:** Overall, teachers expressed positive attitudes toward technology: they said tools increase student interest and make instruction more dynamic. Approximately one-third (around 21 teachers) indicated an interest in trying additional tools (e.g. more frequent use of Kahoot!, Quizizz, and maybe Zoom or other specialized apps). Older teachers and those less familiar with ICT reported greater stress

and a need for more training, particularly regarding MEIS and advanced Teams functionality. However, many teachers voiced concerns about excessive workload and inequity. For example, some teachers noted that students without reliable home internet struggled to participate fully. Others mentioned feeling "overloaded" by frequent tech updates and administrative demands (e.g. multi-platform grading). These feelings of burden reflect broader issues found in the literature.

Together, the results paint a picture of enthusiastic adoption of a few core web tools, but uneven use of their full potential. Surveyed teachers have internalized mainly the global shift to digital teaching tools, yet they also confront the same limitations reported worldwide: technical glitches, equity gaps, and insufficient support for pedagogy.

Discussion

Alignment with Literature

Our case study findings largely mirror global research on web tools in education. Teachers' reports of increased engagement and interactivity with tools like Kahoot! And video content align with meta-analytic results. Özdemir (2024) found moderate-to-large positive effects of Kahoot! On achievement and motivation, which resonates with our teachers' anecdotal evidence of improved quiz performance and enthusiasm. Likewise, broad reviews (Haleem et al., 2022) note that when digital tools are properly integrated, students participate more actively and tend to grasp concepts better. For example, after adopting Teams for classroom materials and discussions, our respondents described more flexible access to resources, confirming Sobaih et al.'s (2021) finding that Teams use enhances access to information and knowledge construction (Al-Maroof et al., 2021).

Our survey highlights Microsoft Teams as a central hub for teaching, mirroring global trends where Teams and other LMS platforms structure online and blended courses. Studies show that students perceive such platforms as effective for accessing resources, collaborating, and receiving feedback. Our case study supports this: teachers rely on Teams for file sharing and assignments, and many appreciate its integration with Office 365. At the same time, some challenges from the literature also appear locally—such as limited participation in online discussions when course design is lecture-heavy, and the need for clearer structure and support.

However, our synthesis also highlights that merely adopting tools is not sufficient. The literature emphasizes how tools are used. Novice use (e.g. uploading a PDF to a platform) produces fewer benefits than pedagogically informed strategies. In our school, many teachers initially treated Teams and PowerPoint as digital flipbooks. The advanced functionalities (branching quizzes, peer editing of documents, etc.) remain underexploited. This reflects a common pattern: systematic reviews report that teachers often underutilize LMS and Web 2.0 features unless they receive training and design support. Indeed, Osorio Vanegas et al. (2023) found that "continuous professional development was the most frequently cited competency" enabling teachers to keep pace with new technologies. Our participants echoed this: several said they would like more in-service training on creative ways to use Teams and interactive platforms. Thus, our data support the literature's call for robust teacher training and collaboration (e.g. professional learning communities) to deepen technology use.

Challenges and Tensions

Several challenges emerged, consistent with recent literature.

Inequitable access and infrastructure: Some teachers noted that students from rural backgrounds often have poor home internet, making synchronous activities difficult. This mirrors UNESCO's warnings about the digital divide: globally, 32% of people still lack internet access, and 60% of primary schools are offline (UNESCO, 2025). Miras et al. (2023) warn that during the pandemic, "unequal access to and use of ICTs" became a decisive factor in social exclusion. Without institutional policies (e.g. loaner devices, campus Wi-Fi access), these disparities limit the reach of web tools.

Teacher workload and support needs: Constant updates to platforms like Teams and Office, plus the need to prepare both online and offline materials, have taxed our teachers. Recent work emphasizes that effective technology integration requires time, instructional design skills, and ongoing professional development. This reflects findings that "the digital revolution… has had a social toll on teachers," who must balance innovation with heavy administrative demands. The literature underscores that effective integration requires sustained support structures: mentoring, technical assistance, and reasonable planning time (Osorio Vanegas et al., 2023). Teachers in our study expressed fatigue that aligns with this advice. Respondents noted that while many are enthusiastic, some (especially older teachers) feel overwhelmed by constant updates, new platforms, and administrative demands (e.g. parallel paper and electronic record-keeping). Research on MS Teams teaching efficacy similarly notes that teacher training and clear institutional support are critical for realizing the platform's potential.

Pedagogical alignment: Technology should serve pedagogy, not the reverse. In line with this, we saw that creative student-centered activities (e.g. student-generated videos) were rare, possibly because teachers were more comfortable using tools in teacher-directed ways. Some older teachers admitted to sticking with lecture-style materials posted online. The literature similarly observes that unless teachers reconceive their lesson plans (moving from "sage on the stage" to facilitator), web tools yield modest gains. This suggests our school, like others, would benefit from embedding web tools into richer instructional designs (project work, peer review, etc.), rather than layering them on top of traditional practice.

Privacy, ethics, and boundaries: Studies on Web 2.0 integration emphasize the need for clear policies on social media use, data privacy, and professional boundaries. Our survey indicates that staff use Viber and WhatsApp for school communication, which is convenient but raises questions about data protection, message overload, and work-life boundaries. Formal guidelines and institutional channels (e.g. school-controlled platforms) could mitigate these concerns.

Synthesis and Implications

Combining the case study with the literature yields several insights. First, effective web tool use requires ecosystem conditions. Infrastructure (broadband, devices) and leadership support must underpin any implementation; equity is foundational. Second, teacher capacity is critical. Continuous professional development is essential (Osorio Vanegas et al., 2023). Our respondents' desire for training in Teams and interactive tools aligns with this: without it, many advanced features will remain unused. Third, integration should be pedagogically driven. Tools should be selected and used according to learning

goals. For example, using Kahoot! mainly for engaging review rather than as an add-on for every lesson, can sustain its impact (Adhikari et al., 2024).

In practice, this means that school leaders and policymakers should not only invest in technology but also in teacher training, digital literacy programs, and ongoing support. The UNESCO (2025) call to view digital learning as a tool for equity rather than division is relevant here. Our case suggests that when teachers are empowered (through training, autonomy, and adequate time) to experiment with web tools, students can benefit significantly. However, if the necessary conditions are missing—poor connectivity, no training, no pedagogical support—the same tools can widen gaps (Miras et al., 2023).

Conclusions and Future Research

This case study, embedded in broader literature, shows that web tools hold great promise for modern education: they can enrich instruction, engage learners, and extend resources beyond the classroom. Drawing on recent systematic reviews and empirical studies (2020–2025), as well as a survey of 120 teachers, we conclude that:

- Web tools are now embedded in daily teaching practice. LMS and collaboration platforms such as Microsoft Teams and Google Classroom, video-conferencing tools, and social media are central infrastructure for contemporary education.
- When thoughtfully integrated, digital tools can enhance engagement, motivation, and learning outcomes. Game-based response systems like Kahoot! and Web 2.0 tools used for collaborative content creation have consistently shown positive effects on student performance and attitudes in diverse settings.
- Teachers at the secondary school in Montenegro reflect global trends: they rely heavily on Teams, PowerPoint, YouTube and messaging apps; they see clear benefits in terms of organization and engagement; and a substantial minority are eager to explore more interactive tools. At the same time, they report familiar problems: technical issues, extra administrative workload, limited training, and varying student access.
- The main levers for improvement lie not in tools themselves, but in pedagogy, support, and policy. Successful use of web tools depends on aligning them with learning objectives, investing in teacher professional development, ensuring equitable access, and setting clear rules for ethical and safe use.

Implications for Practice

The findings of this study suggest that schools should approach the use of web-based tools through a strategic and pedagogically grounded framework, rather than relying on ad-hoc or novelty-driven adoption. Technology integration is most effective when it is purposefully aligned with instructional goals—such as enhancing collaboration, improving formative assessment, or supporting differentiated learning—rather than when tools are introduced without clear educational intent. To implement this effectively, teacher professional development must go beyond technical training and instead focus on helping teachers design meaningful, technology-enhanced learning activities. For instance, training should emphasize how platforms like Microsoft Teams can be leveraged for collaborative group work or how

tools such as Kahoot! can be integrated into formative assessment strategies in ways that meaningfully enrich learning processes.

A supportive school environment is also essential for sustainable technology integration. Schools should establish robust support structures, including accessible IT assistance, peer mentoring systems, and dedicated time for instructional redesign, all of which can ease teacher workload and reduce the stress often associated with adopting new tools. At the same time, institutions must ensure equity and inclusion by addressing differences in students' access to devices, internet connectivity, and digital skills. Clear alternative pathways should be available for students who cannot fully participate online to prevent widening achievement gaps. Additionally, comprehensive governance and ethical guidelines are needed to regulate the use of social media platforms, messaging apps, and any tools that involve student data. These guidelines should safeguard privacy, define appropriate boundaries for communication, and ensure the responsible, transparent use of digital platforms in the school environment.

Future Research Directions

Building on these findings, future research should first prioritize longitudinal examinations of learning outcomes, as current studies often focus on short-term impacts of digital tools. Extended investigations tracking the sustained use of platforms such as Microsoft Teams, Google Classroom, or Kahoot! over multiple academic years could provide deeper insight into their effects on achievement, knowledge retention, and the development of higher-order cognitive skills. In addition, comparative, context-sensitive studies are needed to understand how variations in infrastructure, school type, and cultural expectations influence the success of web-based tools. Such comparative work, spanning different regions or socio-economic settings, would help clarify which conditions enable or hinder effective integration.

Further research should also investigate teacher professional development models, examining which approaches—such as coaching-based support, structured workshops, communities of practice, or micro-credentialing—best help teachers build sustained digital pedagogical competence. At the same time, the field would benefit from studies that expand the focus from teachers to learners, exploring student agency and co-creation through web tools. Understanding how students can act as content creators, peer teachers, or co-designers of digital learning environments may illuminate new pathways for enhancing motivation and developing critical digital literacy skills.

Finally, future investigations should address the ethical, psychological, and well-being dimensions of digital tool usage. As students and teachers spend more time online and interact with systems that collect personal data, research is needed to understand issues related to digital burnout, online safety, privacy perceptions, and potential algorithmic bias. Moreover, with the increasing presence of AI-driven platforms—such as chatbots, adaptive learning systems, and recommendation tools—scholars should explore how these technologies can be responsibly integrated into existing ecosystems of educational web tools. Such studies should consider questions of transparency, human oversight, and pedagogical value. Taken together, these research directions can help shift the field from focusing merely on digital tool adoption toward a more mature understanding of how technology can support meaningful, equitable, and human-centered education in the long term.

Conflict of Interest

The authors declare no conflict of interest.

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