THE ROLE OF DIGITAL TECHNOLOGIES IN DEVELOPING STUDENTS' CRITICAL THINKING SKILLS

Nigina Erkinovna Shavkatova
Buxoro davlat pedagogika instituti taqdiqotchisi
DOI:https://doi.org/10.5281/zenodo.23026447

Abstract. The rapid integration of digital technologies into education has changed how students access information, communicate, solve problems, and construct knowledge. These changes create important opportunities for the development of critical thinking, but technology itself does not automatically produce critical thinkers. This article examines the pedagogical role of digital technologies in developing students' critical thinking skills, with particular attention to English language education. Drawing on a qualitative literature-review approach, the article synthesizes research on technology-assisted critical-thinking development and considers how digital tools can support source evaluation, analysis, collaboration, problem-solving, decision-making, and reflection. Recent research indicates that the educational value of technology depends strongly on the quality of pedagogical design: students need purposeful tasks that require them to question information, compare perspectives, justify claims, discuss evidence, and reflect on their reasoning. The article also highlights the central role of teachers as learning designers and facilitators. In English language classrooms, digital texts, collaborative platforms, multimedia resources, online discussions, and carefully guided AI-supported activities can create meaningful contexts for higher-order thinking. At the same time, misinformation, distraction, unequal access, insufficient digital competence, and overreliance on technological tools remain significant challenges. The article concludes that digital technologies are most effective when they amplify inquiry-based, collaborative, problem-oriented, and reflective pedagogy rather than replace it.

Keywords: digital technologies, critical thinking, English language education, EFL, digital literacy, problem-solving, reflection

1. Introduction

Critical thinking has become an increasingly important educational goal because students are expected not only to remember information but also to interpret evidence, identify assumptions, evaluate competing claims, solve problems, and make reasoned decisions. Facione (1990) conceptualized critical thinking through skills such as interpretation, analysis, evaluation, inference, explanation, and self-regulation. These abilities are particularly important in contemporary learning environments, where students encounter large quantities of information through digital media.

Digital technologies have substantially expanded students' access to information and communication. Search engines, digital libraries, multimedia materials, collaborative platforms, online discussion spaces, and artificial intelligence tools can provide learners with opportunities to explore ideas beyond the boundaries of a traditional textbook. However, access to more information does not necessarily mean better thinking. Students may encounter inaccurate, biased, incomplete, or misleading information, and they may accept convenient answers without examining the evidence behind them.

Recent research in English language education suggests that technology can support critical-thinking development when it is integrated into carefully designed learning activities. Liang (2023), for example, synthesized 33 studies and identified four evidence-based principles: students should have

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

opportunities to understand learning materials deeply, practise different critical-thinking skills, participate in interaction and reflection, and engage in decision-making and problem-solving. A more recent systematic review similarly emphasizes that the impact of information and communication technologies is mediated by pedagogical design and that active learning remains central (Leon Diaz et al., 2026).

The purpose of this article is therefore to examine how digital technologies can contribute to students' critical-thinking development and to identify pedagogical conditions that make technology use educationally meaningful. Particular attention is given to English language education, where digital resources can simultaneously support language development and higher-order thinking.

Research Questions

1. How can digital technologies support the development of students' critical-thinking skills?
2. Which types of technology-supported learning activities are particularly relevant to analysis, evaluation, problem-solving, and reflection?
3. What role does the teacher play in ensuring that technology use contributes to critical-thinking development?
4. What challenges should educators consider when integrating digital technologies for critical-thinking purposes?

2. Literature Review

2.1. Understanding Critical Thinking

Critical thinking is not simply the ability to criticize information. It involves purposeful and reasoned judgment. Facione (1990) identifies interpretation, analysis, evaluation, inference, explanation, and self-regulation as core cognitive skills. In educational settings, these skills become meaningful when learners apply them to disciplinary content, authentic problems, texts, arguments, and real-world decisions.

Research also indicates that critical thinking is closely connected to dialogue and the quality of learning tasks. Jegstad et al. (2025), in a systematic review of 105 articles on primary education, categorized classroom approaches to critical thinking as textual, dialogic, digital, or practical. Their findings underline the importance of selecting content that can stimulate critical dialogue rather than treating critical thinking as a completely separate skill.

2.2. Digital Technologies and Critical-Thinking Development

Digital technologies can create learning environments in which students move beyond receiving information and instead actively search, compare, interpret, question, discuss, and produce knowledge. Liang (2023) found that informative and communicative technologies were frequently used in research on technology-assisted critical-thinking cultivation in English language education. The review emphasized that technology becomes more valuable when it is connected to interaction, reflection, decision-making, and problem-solving.

The evidence does not support the idea that technology is automatically beneficial. Leon Diaz et al. (2026) found that the effect of ICT on critical thinking is strongly mediated by pedagogical design. Their review highlights active learning approaches such as problem-based learning and inquiry, while also emphasizing the teacher's role as a designer of learning experiences. Thus, the central question is not whether technology is present, but what students are required to do with it.

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

3. Digital Technologies as Tools for Critical-Thinking Development

3.1. Accessing and Evaluating Multiple Sources

One of the most direct connections between digital literacy and critical thinking is the evaluation of online information. Students can be asked to locate several sources addressing the same issue and compare their evidence, authorship, purpose, date, language, and reliability. Such tasks encourage learners to recognize that information is not equally trustworthy.

For example, in an English language lesson, students can compare two online articles presenting different positions on a social or educational issue. Rather than asking which text they prefer, the teacher can ask: What evidence does each author provide? Which claims are supported? What assumptions are present? What information is missing? These questions shift students from passive reading to analytical evaluation.

3.2. Collaboration and Digital Communication

Collaborative technologies can also support critical thinking by creating spaces for students to exchange interpretations and challenge one another's ideas. Online discussion boards, shared documents, collaborative presentation platforms, and digital concept-mapping tools can make students' reasoning visible to others.

The value of collaboration, however, depends on task design. A digital activity that merely asks students to copy or post information is unlikely to require substantial critical thinking. In contrast, a task that asks learners to defend a position, respond to counterarguments, synthesize different viewpoints, or reach a justified group decision creates stronger cognitive demands.

3.3. Problem-Solving and Decision-Making

Digital environments are particularly suitable for problem-based tasks because learners can access information, test possible solutions, compare alternatives, and revise their decisions. In English language education, students can work with authentic problems such as designing a sustainable tourism plan, responding to a customer complaint, evaluating an online advertisement, or deciding which source should be used in an academic presentation.

Such activities integrate language learning with higher-order thinking. Students need topic-specific vocabulary and grammatical resources, but they also need to justify choices, interpret evidence, negotiate meaning, and explain why one solution may be more appropriate than another.

4. Digital Technologies and Reflective Learning

Reflection is an essential component of critical thinking because learners need to examine not only what they believe but also how they reached a conclusion. Digital portfolios, reflection journals, audio reflections, blogs, and collaborative learning logs can provide opportunities for students to review their reasoning.

A useful reflective sequence is: Access → Understand → Analyze → Compare → Evaluate → Discuss → Reflect. The sequence is not a rigid teaching formula; rather, it illustrates how a digital task can move students from information access toward increasingly complex forms of thinking. Reflection can be strengthened by prompts such as 'What evidence changed your view?', 'Which source was most convincing and why?', and 'What would you investigate next?'

5. Digital Technologies in English Language Teaching

English language education provides a particularly productive context for technology-supported critical thinking because language is both a medium for communication and a resource for reasoning. Digital texts, videos, podcasts, online news, discussion platforms, and multimedia presentations can expose learners to multiple perspectives and authentic language use.

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

For reading, students can evaluate the credibility of online sources, identify an author's assumptions, compare competing arguments, and distinguish evidence from opinion. For speaking, students can participate in structured debates, problem-solving discussions, and decision-making tasks. For writing, learners can synthesize multiple sources, construct arguments, respond to counterclaims, and revise their positions after receiving peer feedback.

Artificial intelligence tools also create new possibilities and challenges. They can provide examples, alternative explanations, language support, and feedback, but students should not be encouraged to treat AI-generated responses as automatically correct. Instead, teachers can require learners to verify claims, identify weaknesses, compare AI-generated content with reliable sources, and revise or reject suggestions when evidence does not support them. In this way, the technology becomes an object of evaluation as well as a learning tool.

6. The Teacher's Role

The teacher remains central to the successful integration of digital technologies. Technology can provide access to information and communication, but teachers determine the learning objectives, select appropriate resources, design questions, establish interaction patterns, and scaffold students' reasoning. The recent literature therefore positions the teacher as a learning designer rather than a passive user of technology (Leon Diaz et al., 2026).

Teachers can promote critical thinking by modeling how to question a source, think aloud while evaluating evidence, ask open-ended questions, encourage respectful disagreement, and require students to justify conclusions. They can also provide scaffolding for learners who have limited digital literacy or limited language proficiency.

Table 1

Examples of Digital Activities for Critical-Thinking Development

Learning objective	Digital activity	Critical-thinking process
Evaluate information	Compare two or more online sources	Analysis and evaluation
Build an argument	Collaborative digital debate	Inference and explanation
Solve a problem	Online case study or simulation	Problem-solving and decision-making
Reflect on learning	Digital journal or portfolio	Self-regulation and reflection
Synthesize perspectives	Shared concept map or presentation	Analysis and synthesis

7. Challenges and Limitations

Despite its potential, digital technology presents several challenges. First, students may encounter misinformation, manipulated content, or unreliable sources. This makes digital and media literacy an essential component of critical-thinking instruction. Students need explicit guidance on how to evaluate authorship, evidence, purpose, date, and corroboration.

Second, technology can create distraction. Constant notifications, rapid movement between applications, and the abundance of available content may reduce sustained attention. Teachers therefore need to establish clear purposes and boundaries for digital tasks.

Third, access to devices, stable internet connections, and appropriate digital resources is not equally distributed. UNESCO (2023) emphasizes that educational technology should be considered in relation to

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

equity, relevance, sustainability, and human interaction. Technology should therefore not be treated as a substitute for thoughtful pedagogy or meaningful teacher-student interaction.

Finally, insufficient teacher preparation can limit the educational value of technology. Digital competence involves more than knowing how to operate applications; teachers need to understand how particular tools can support learning objectives, assessment, interaction, and student autonomy.

8. Discussion

The reviewed literature indicates that digital technologies are best understood as pedagogical affordances rather than independent causes of critical-thinking development. The strongest potential appears when technology is embedded in activities that require students to interpret information, compare perspectives, evaluate evidence, communicate reasoning, solve problems, and reflect.

This conclusion is consistent with Liang's (2023) synthesis of research in English language education, which links technology-assisted critical thinking to self-study, practice of thinking skills, interaction and reflection, and decision-making and problem-solving. It is also consistent with Leon Diaz et al. (2026), whose systematic review stresses the primacy of pedagogy over technology.

For English language teachers, this means that the introduction of a new digital tool should begin with a pedagogical question: What kind of thinking should students demonstrate through this activity? Once the cognitive objective is clear, the teacher can select the technology that best supports it. This approach reduces the risk of using technology simply because it is available or fashionable.

9. Implications for English Language Education

Design digital tasks around explicit critical-thinking objectives rather than around the technology itself.

Teach students to evaluate the credibility, evidence, purpose, and limitations of digital information.

Use collaborative digital activities that require explanation, justification, disagreement, and synthesis.

Integrate problem-based and inquiry-oriented tasks into reading, speaking, writing, and project work.

Use reflection to help students examine how their conclusions were formed and revised.

Treat AI-generated information as material to be checked and evaluated rather than automatically accepted.

Provide scaffolding and alternative access routes for learners with different levels of language and digital competence.

10. Conclusion

Digital technologies can make an important contribution to the development of students' critical-thinking skills, particularly when they expand opportunities for inquiry, collaboration, source evaluation, problem-solving, decision-making, and reflection. Nevertheless, technology should not be viewed as a replacement for effective pedagogy. Its educational value depends on the quality of the tasks, the teacher's mediation, the relevance of the content, and the opportunities students receive to explain and evaluate their reasoning.

In English language education, digital technologies can create authentic contexts in which learners use language to examine ideas, compare perspectives, construct arguments, and solve meaningful problems. The most productive approach is therefore not technology for its own sake, but intentional technology integration guided by clear learning objectives and critical-thinking principles. Future research should continue to examine how different digital environments, including AI-supported learning, affect students' reasoning across different educational contexts and levels of language proficiency.

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

References

1. Facione, P. A. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. The California Academic Press.
2. Jegstad, K. M., Heggernes, S. L., Jøsok, E., Ryen, E., Svanes, I. K., & Tørnby, H. (2025). Approaches to critical thinking in primary education classrooms: A systematic review. Educational Research Review, 48, 100711. doi:10.1016/j.edurev.2025.100711
3. Leon Diaz, F. Y., Boude Figueredo, O. R., & Vargas Sanchez, A. D. (2026). Pedagogical mediation with ICT for the development of critical thinking in primary education: A systematic review. Thinking Skills and Creativity, 60, 102085. doi:10.1016/j.tsc.2025.102085
4. Liang, W. (2023). Towards a set of design principles for technology-assisted critical-thinking cultivation: A synthesis of research in English language education. Thinking Skills and Creativity, 47, 101203. doi:10.1016/j.tsc.2022.101203
5. Starkey, L. (2021). Technology-enhanced learning environments to develop critical thinking: A systematic review. Thinking Skills and Creativity, 41, 100913. doi:10.1016/j.tsc.2021.100913
6. UNESCO. (2023). Global education monitoring report 2023: Technology in education—A tool on whose terms? UNESCO.

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.