Assessing Critical Thinking in EFL through Technology-Based Tools: Opportunities and Challenges in International and Algerian Contexts

تقييم التفكير النقدي في تعليم اللغة الإنجليزية كلغة أجنبية من خلال الأدوات القائمة على التكنولوجيا: الفرص والتحديات في السياقات الدولية والجزائرية

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Abstract:

In English as a Foreign Language (EFL) education, fostering critical thinking (CT) is a key goal, yet assessing it poses difficulties. Traditional assessment methods often emphasize language accuracy over reasoning, which limits their capacity to assess higher-order thinking skills. This review investigates the use of technology-based tools for assessing CT among EFL learners, synthesizing findings from international and Algerian studies to question whether digital platforms offer more valid and practical alternatives to traditional assessments.

Keywords: critical thinking, EFL, technology-based assessment, digital tools, Algeria.

الملخص:

في تعليم اللغة الإنجليزية كلغة أجنبية(EFL) ، تعدّ تنمية مهارات التفكير النقدي هدفًا أساسيًا، إلا أن تقييمها يمثل تحديًا كبيرًا. فطرق التقييم التقليدية غالبًا ما تركّز على دقة اللغة أكثر من تركيزها على مهارات الاستدلال، مما يحدّ من قدرتها على قياس مهارات التفكير العليا. تستعرض هذه الدراسة استخدام الأدوات القائمة على التكنولوجيا في تقييم التفكير النقدي لدى متعلمي اللغة الإنجليزية كلغة أجنبية، من خلال تحليل نتائج دراسات دولية وجزائرية، بهدف التحقق مما إذا كانت المنصات الرقمية تقدّم بدائل أكثر مصداقية وفاعلية من طرق التقييم التقليدية.

الكلمات المفتاحية: التفكير النقدي، اللغة الإنجليزية كلغة أجنبية، التقييم القائم على التكنولوجيا، الأدوات الرقمية، الجزائر.

Introduction

Research published from 2015 to 2025 was reviewed from databases like Scopus, Web of Science, ScienceDirect, and local Algerian journals. The selected studies focused on technology-enhanced assessment practices in EFL or similar second-language settings, particularly their effectiveness in measuring CT. Digital tools offer several advantages, such as efficiency, scalability, learner engagement, and detailed performance data. The Algerian studies indicate that despite the increasing integration of technology in classrooms, challenges remain, such as student awareness, teacher preparation, and infrastructure limitations. Technology-based assessment holds promise but requires thoughtful task design, teacher training, and supportive institutional policies, particularly in Algerian EFL contexts. More longitudinal and comparative research is needed to confirm its effectiveness and support its sustainable integration into EFL classrooms.

Critical thinking (CT) has emerged as a fundamental element of education in the 21st century, appreciated for its contribution to nurturing independent learning, problem-solving, and informed decision-making (Facione, 1990). Within English as a Foreign Language (EFL) settings, cultivating CT enables learners to critically engage with texts, interpret meaning in intercultural exchanges, and perform more effectively in academic and professional environments (Atkinson, 1997; Yeh, 2019). As a result, language educators are increasingly encouraged to incorporate CT into EFL curricula as both an educational objective and an assessment criterion.

Although there is significant progress, current research in EFL assessment often emphasizes linguistic accuracy and test performance rather than assessing students' reasoning and problem-solving skills. Notably, while several international studies underscore the potential of digital tools in supporting CT assessment, the literature is fragmented, presenting diverse findings regarding their effectiveness, accessibility, and educational implications. Moreover, in regions like Algeria, the integration of technology in EFL assessment is still developing, with

limited studies explicitly exploring how digital tools can be utilized to assess or enhance CT in line with global trends.

This review aims to address these gaps by synthesizing studies published between 2015 and 2025 on technology-based CT assessment in EFL classrooms. It seeks to identify the reported benefits and challenges across different contexts, compare international and Algerian perspectives, and highlight the implications for both policy and practice. By doing so, the review enhances understanding of how digital tools can transcend language accuracy assessment to capture deeper cognitive processes, thereby aligning EFL education with 21st-century skills.

The paper is structured as follows: initially, it defines the key concepts of CT and technology-based assessment; next, it reviews the primary digital tools used in EFL classrooms; then, it synthesizes empirical findings on their advantages and limitations; and finally, it discusses implications for EFL pedagogy and future research directions.

1. Key Concepts

As a prelude to examining technology-based assessments of critical thinking in EFL contexts, it is important to clarify the key concepts central to the review, clarifying their meaning and relevance.

1.1 Critical Thinking (CT)

1.1.1 Definition

Defining critical thinking is challenging due to its complexity and the debates surrounding it. Numerous academics have tried to clarify it, each offering unique perspectives. Paul and Elder (2006) characterize critical thinking as "that mode of thinking - about any subject, content or problem – in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structure inherent in thinking and imposing intellectual standards upon them" (p. 41). They stress that critical thinking is both intentional and purposeful. Similarly, Ennis (1989) perceives critical thinking as reflective thinking that aids individuals in determining what to believe or what actions to take. It is

regarded as a mental habit that allows individuals to analyze, criticize, draw conclusions, and make inferences (Qing, 2013). In a similar context, Abrami et al. (2008, p. 1104) state that critical thinking "normally means making sound judgements and claims that meet epistemologically acceptable standars".

Paul (1995) makes a distinction between two forms of critical thinking: strong sense or true critical thinking and weak sense or sophistic critical thinking. According to Paul, true critical thinkers are those who endeavor to put aside their ethnocentric biases and consistently apply reasoning in their quest for truth. On the other hand, weak-sense thinkers primarily use reasoning to support their own views or interests, often ignoring the validity of others' arguments. Reed (1998) notes that after extensive debate, a consensus definition of critical thinking was eventually reached by 46 experts through the American Philosophical Association's Delphi panel. This panel defined critical thinking as "a purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, and criteriological, or contextual considerations upon which that judgment is based".

1.1.2 Critical Thinking Components

The concept of critical thinking is often described as a combination of a number of components. Zare (2015) notices that there is an agreement among experts that critical thinking consists of six main components, each consisting of sub-skills, as shown in table 1 below:

Table 1

Critical Thinking Cognitive Skills and Sub-Skills Adopted from Facione (Cited in Zare, 2015)

Skills	Subskills
Interpretation	- Categorization - Decoding Significance - Clarifying Meaning
Analysis	- Examining Ideas - Identifying Arguments - Analyzing Argument
Evaluation	- Assessing Arguments - Assessing Claims
Inference	- Querying Evidence - Conjecturing Alternatives - Drawing Conclusions
Explanation	- Stating Results - Justifying Procedures - Presenting Arguments
Self-Regulation	- Self-Examination - Self-Correction

Watson and Glaser (2012, p. 2) define critical thinking as a combination of (a) attitudes, (b) knowledge, and (c) skills. According to them, critical thinking involves the following components:

1- Attitudes of inquiry: which involve acknowledging that there are problems and accepting that evidence is necessary to establish what is true.
2- Knowledge: involves an awareness of the nature of abstractions, generalizations and inferences that aid in reaching an acceptable degree of accuracy of the different evidences, and then these evidences are determined logically.
3- Skills: involve the ability to employ and apply the above knowledge and attitudes.

1.1.3 The Importance of Critical Thinking

The significance of critical thinking skills has been highlighted in education as a crucial objective, not just for academic achievement but for overall life success. It is considered the most vital element for success in the 21st century (Chaffee, 2015). Furthermore, it is contended that students must learn to think critically to achieve their highest potential in the future. Educators have maintained that critical thinking and reasoning are essential skills for thriving in our ever-

evolving world. Consequently, it is identified as one of the primary goals of all educational institutions (Halpern, 2003; Paul, 1995).

For decades, fostering critical thinking abilities in academic settings has been viewed as a key aim in education, particularly in higher education. The rationale for this focus is to prepare students to function effectively in society, enhance their ability to evaluate information, and make sound decisions (Daniel, 2013). Cultivating students' critical thinking skills equips them with the ability to learn effectively and think clearly, leading to accurate judgments. A student who can think critically poses relevant questions, focuses on pertinent information, engages in logical reasoning, and thus can draw reliable conclusions (Halpern, 1998).

Critical thinking has been a pedagogical focus across nearly all academic disciplines. Researchers have also emphasized its importance in ESL/EFL contexts (Zare, 2015). Some scholars have worked to integrate critical thinking training into both content-based and general courses, implementing it in higher education. Qing (2013) argues that critical thinking can boost students' self-confidence and create opportunities for a successful life. Therefore, equipping students with various critical thinking skills is of utmost importance.

There is a growing recognition that educational systems in many universities worldwide, particularly in Algeria, do not adequately focus on developing students' critical thinking skills. Language instruction tends to prioritize grammar and vocabulary knowledge over advanced cognitive skills like inference, evaluation, and analysis. For example, Achoura & Merrouche (2021) conducted a survey of 76 secondary-school EFL teachers and observed 11 teachers in the Wilaya of Oum El Bouaghi, Algeria. They discovered that despite many teachers claiming to teach critical thinking, there is a "clear absence of the teaching of CT" in practice. Additionally, another study by Mohammed Hadj Said (2023) examined the secondary school EFL textbook At the Crossroads through teacher questionnaires, revealing that the textbook includes very few tasks that truly encourage critical thinking, and those that do are not diverse.

1.1.4 Critical Thinking in EFL Contexts

Critical thinking emerged in the realm of EFL/ESL as a consequence of adopting the communicative approach in English language teaching (Wang & Zheng, 2016). It has become evident that critical thinking is essential for EFL learners to enhance their English proficiency and apply their knowledge in novel contexts. Day (2003) points out that discussions regarding the impact of critical thinking on language learning began in the late 1970s with the introduction of the communicative approach in foreign language teaching. However, he notes that the term "critical thinking" became prominent in this field during the 1990s.

Researchers and academics have identified a positive and strong connection between critical thinking and language acquisition (Davidson & Dunham, 1995). Consequently, critical thinking is incorporated into various EFL courses through effective methodologies, such as employing strategies that focus on metacognitive processes to encourage effective thinking (Zare, 2015). Recent research has emphasized that fostering critical thinking is a crucial component of English teaching and learning. Empirical studies conducted in diverse EFL settings have demonstrated that critical thinking skills can be taught within academic EFL instruction (Wang & Zheng, 2016). Daniel (2013) proposes that critical thinking can be taught in EFL classrooms because it involves metacognitive processes.

In the literature, it is evident that language proficiency is vital for comprehending academic texts and topics and for articulating opinions clearly, which ultimately contributes to academic achievement. To effectively utilize language skills, a high level of language proficiency is necessary. According to the American Council of the Teaching of Foreign Languages (ACTFL), language proficiency is defined by what a learner can accomplish with the language across five levels: novice, intermediate, advanced, superior, and distinguished (Daniel, 2013).

Kameo (2007) notes that proficiency in English as a foreign language encompasses both linguistic competence and performance competence. To enhance these competences, certain internal factors must be

considered, one of which is the critical thinking ability of EFL learners. Krashen and Brown (2007) suggest that language proficiency consists of two main components: knowledge of the language itself and understanding of the contexts in which it is used. They further assert that critical thinking skills are essential for EFL learners to acquire such knowledge. Moreover, Heining-Boynton and Heining-Boynton (1992) highlight that a key goal of education in EFL classrooms is to prepare students for real-world contexts. To fulfill this goal, EFL teachers should promote the practical application of the academic curriculum. Similarly, Hoch and Hart (1991) argue that incorporating critical thinking into EFL classrooms enhances students' ability to apply their language skills in real-life situations. Therefore, it is crucial to emphasize that critical thinking and language proficiency are closely linked.

1.2 Technology-Based Assessment

1.2.1 Evolution of Assessment in the EFL/ESL Classrooms

The evolution of assessment in EFL/ESL classrooms has been a continuous process, mirroring shifts in education, technology, and societal demands. In the past, traditional methods dominated the assessment landscape, serving as a foundation but also presenting certain limitations.

In EFL/ESL settings, these traditional assessment methods mainly involved standardized tests, quizzes, and written exams. Typically, summative in nature, these methods aimed to assess students' knowledge and skills at the conclusion of a learning period (Cheng & Wang, 2008). Although they offered a structured and consistent approach to measuring language proficiency, they often prioritized rote memorization and the repetition of information. The emphasis was largely on the outcome of learning – the final score or grade – rather than the learning process itself.

A key drawback of these traditional methods was their inability to capture the comprehensive nature of language learning. Language acquisition involves a complex interaction of various skills – listening,

speaking, reading, and writing – each intertwined with cultural nuances, contextual understanding, and personal experiences. Standardized tests, with their inflexible formats and fixed answer keys, often fell short in assessing these intricate aspects of language learning. Furthermore, they provided limited feedback, offering students a numerical score but little insight into their strengths, weaknesses, or areas needing improvement (Swaie & Algazo, 2023).

As the drawbacks of traditional methods became more apparent, the EFL/ESL community started to investigate alternative assessment approaches. At the turn of the century, there was a rising interest in formative assessments, portfolio-based evaluations, and performance tasks, all designed to evaluate students in more genuine and meaningful settings (Singh et al., 2022).

The introduction of technology further transformed the assessment landscape. With the widespread availability of digital tools and platforms, online assessment techniques began to gain popularity. These techniques, which include online quizzes, e-portfolios, automated feedback systems, and peer reviews, provided a level of flexibility and personalization that was previously impossible (Lv, Ren, & Xie, 2021). For example, online platforms allowed for real-time feedback, enabling students to receive immediate input on their performance and make necessary adjustments. Additionally, digital tools supported collaborative assessments, facilitating peer interactions and group evaluations in virtual environments (Cao et al., 2022).

Nevertheless, the full potential of online assessment techniques became evident during the extraordinary challenges of the COVID-19 pandemic. As educational institutions globally shifted to remote learning, online assessments turned into the standard practice rather than an exception. Educators, who previously depended on face-to-face interactions, had to adjust and innovate, discovering new methods to evaluate students in virtual settings (Pu & Xu, 2021).

The transformation of assessment in EFL/ESL classrooms reflects the broader changes in education and technology. From traditional paper-and-pencil exams to dynamic online platforms, assessment techniques

have consistently adapted to address the evolving needs of learners and educators. As we progress, it is crucial to find a balance, leveraging the advantages of both traditional and online methods to develop a comprehensive and effective assessment system.

1.2.2 Key Technology Tools for Assessing Critical Thinking

In recent times, technology has introduced novel methods for evaluating and enhancing critical thinking (CT) skills among EFL learners. Tools like AI writing assistants, collaborative platforms, interactive quizzes, and LMS systems enable educators to assess higher-order thinking more effectively than traditional methods. The sections below outline the primary technology-based tools used to evaluate CT in EFL settings, backed by academic research.

1.2.2.1 AI Writing Assistants for Enhancing Critical Thinking

AI-driven writing assistants such as ChatGPT, Grammarly, and Quillbot have been shown to effectively aid EFL learners in developing their critical thinking, especially in writing tasks. These tools offer real-time feedback on argumentation, coherence, and structure, prompting students to engage in higher-order thinking processes. Guendouz and Benettayeb (2025) investigated the use of AI-powered tools in EFL writing and discovered that students found these tools beneficial for enhancing critical thinking skills, despite challenges like overreliance on AI and limited personalization.

1.2.2.2 Collaborative Platforms to Foster Critical Discourse

Collaborative platforms, such as Google Docs, Padlet, and Kialo, create environments where EFL learners can participate in peer review, debates, and discussion-based activities. These platforms assist students in evaluating different perspectives, constructing arguments, and refining reasoning skills. Alqahtani (2022) emphasized the use of the Stanford Mobile Inquiry-based Learning Environment (SMILE), which involves learners in asking, sharing, answering, and evaluating questions. This process promotes active learning and significantly enhances critical thinking in EFL contexts.

1.2.2.3 Interactive Quizzes and Gamified Assessments

Interactive quizzes and gamified platforms like Kahoot, Quizizz, and Quizlet present scenario-based questions, problem-solving tasks, and analytical challenges that allow students to apply critical thinking in an engaging manner. Hwang, Chiu, and Chen (2025) found that computer-assisted interactive reading models significantly improved EFL learners' critical thinking skills by providing immediate feedback and encouraging reflective thinking.

1.2.2.4 Learning Management Systems with Analytical Tools

Learning Management Systems (LMS) such as Moodle and Blackboard offer analytical tools that help educators track students' progress, participation, and engagement over time. These platforms enable teachers to identify areas where learners need further development in critical thinking. Belarbi and Bensafa (2020) found that positive perceptions of technology within LMS environments were linked to more favorable attitudes toward critical thinking, highlighting the role of LMS platforms in supporting CT development in EFL learners.

2.2.5 AI-Resilient Assessment Tools

With the growing use of AI tools in academic settings, AI-resilient assessment designs are crucial to ensure authentic evaluation of critical thinking. These tools incorporate frameworks like Bloom's Taxonomy with natural language processing to assess the depth of student responses, reducing reliance on AI-generated answers. Biletska, Dmytrenko, and Petrenko (2021) proposed a web-based Python tool that evaluates assessment tasks for AI-resilience, promoting originality and higher-order thinking skills in EFL learners.

3. Methodology

In this paper, a narrative literature review method is employed to investigate the use of technology-based tools for evaluating critical thinking in English as a Foreign Language (EFL) settings, with a

specific focus on Algeria. The review involved searching electronic databases like Scopus, ERIC, ScienceDirect, SpringerLink, Shamaa, and Google Scholar, utilizing keywords such as critical thinking, EFL assessment, technology-based assessment, digital platforms, and Algeria. Studies were included if they were empirical or review articles that explored critical thinking in EFL using digital or technological approaches, while theoretical papers lacking empirical evidence were not considered. The selected studies underwent thematic analysis, with findings categorized into two main areas: global perspectives and Algerian perspectives. Emphasis was placed on research that demonstrated methodological rigor, pedagogical significance, or offered clear implications for EFL practice.

4. Results

The review highlighted a selection of international and Algerian studies that shed light on the use of technology-based tools for assessing critical thinking (CT) in English as a Foreign Language (EFL) settings. Instead of attempting to encompass all existing research, the analysis concentrated on a curated set of significant studies published between 2015 and 2025, which illustrate key trends, methodologies, and challenges.

On a global scale, several studies demonstrate how digital platforms facilitate novel methods of CT assessment. Hung (2019) showed that digital storytelling offers EFL learners genuine contexts for engaging in higher-order thinking. Lu and Xie (2019) emphasized how collaborative writing platforms encourage peer interaction and collective reasoning, uncovering processes often missed in traditional assessments. Chen and Tsai (2021) explored the role of automated scoring and feedback systems, highlighting both their efficiency and the concerns they raise about validity. Li and Li (2022) contributed an important viewpoint by examining teachers' perceptions, stressing the necessity for professional readiness to create CT-focused assessment tasks. In their systematic review, Li and Wang (2024) determined that digital tools like WebQuests, online debates, and gamified platforms greatly enhance learners' abilities in analysis and evaluation when paired with well-defined rubrics and formative feedback. Similarly,

Aloraini (2023) showed that a video self-study program on Telegram boosted Saudi learners' analytical and inferential thinking, although improvements in evaluation and induction were less significant, indicating that not all aspects of critical thinking are equally influenced by technology. From an evaluation perspective, Mensah and Okyere (2022) created a tool to assess critical thinking in expository essays, which effectively captured higher-order reasoning in problem–solution writing. Concurrently, Zouari and Chen (2023) discovered that learners generally had positive views of technology-based assessments, but they warned that positive perceptions alone do not ensure better performance unless supported by robust instructional design and teacher guidance. A summary of these studies is provided in Table 1.

In the Algerian context, empirical research highlights both the potential and limitations of incorporating technology into CT assessment. Bougherara (2019) discovered that while teachers are increasingly using digital tools in classrooms, learners often remain unaware of their potential to enhance critical thinking. Belarbi and Bensafa (2020) criticized the national EFL Baccalaureate exam for emphasizing linguistic accuracy over higher-order reasoning, suggesting the need for reforms in assessment design. In higher education, Zitouni (2025) demonstrated that digital portfolio assessment fostered reflective learning and evaluative judgment among university students, although its adoption was hindered by teachers' workload and a lack of institutional support. Similarly, Chougrani (2023) discovered that portfolios aided secondary-school students in enhancing their planning, monitoring, and self-evaluation skills in writing tasks, emphasizing the formative benefits of technology when feedback is systematically incorporated. On the policy and curriculum front, Brahimi (2022) pointed out the absence of explicit critical-thinking goals in national EFL textbooks, which complicates the consistent implementation of technology-based assessments by teachers. Teacher perceptions add another layer of complexity: Bouzid (2020) noted that while secondary-school teachers acknowledged the potential of ICT to enhance critical thinking, exam-focused practices and limited digital access impeded its application. Supporting these findings, Hadj Said (2025) emphasized the importance of media literacy in promoting critical engagement in Algerian EFL classrooms

but observed that inadequate teacher training and infrastructural limitations obstruct long-term effectiveness. More recently, Zitouni (2025) documented resource constraints and large class sizes as obstacles to implementing technology-based assessments in universities, while Guendouz and Benettayeb (2025) examined the cautious adoption of AI-powered tools in Algerian higher education. These findings are synthesized in Table 2.

Collectively, the results suggest that digital tools offer promising avenues for assessing CT across contexts, yet their effectiveness relies on careful task design, teacher training, and equitable access to technological resources.

Table 1

International Studies on Technology-Based Assessment of CT in EFL

Authors & Year	Focus of Study	Tools / Methods	Main Findings
Hung (2019)	Digital storytelling and CT in EFL	Digital storytelling platforms	Provided authentic contexts for higher-order thinking and CT development.
Lu & Xie (2019)	Collaborative writing and peer reasoning	Online collaborative writing platforms	Enhanced peer interaction and collective reasoning, revealing processes often missed in traditional assessments.
Chen & Tsai (2021)	Automated scoring & feedback in CT assessment	AI-based automated feedback/scoring systems	Increased efficiency but raised concerns about validity and fairness.
Li & Li (2022)	Teachers' perceptions of CT assessment	Teacher surveys/interviews	Highlighted the importance of professional readiness to design CT-focused assessment tasks.
Li & Wang (2024)	Systematic review of digital CT interventions	Review of multiple studies (WebQuests, online debates, gamified platforms)	Concluded digital tools effectively support analysis & evaluation when paired with rubrics and formative feedback.
Aloraini (2023)	CT via Telegram-based video self-study	Telegram platform with video-based tasks	Improved analytical & inferential thinking in Saudi learners, but limited gains in evaluation & induction.

Mensah & Okyere (2022)	Assessment of CT in expository essays	Developed CT-measurement instrument	The tool was reliable in capturing higher-order reasoning in problem–solution writing.
Zouari & Chen (2023)	Learners' perceptions of tech-based CT assessment	Perception-based study (surveys)	Learners viewed tools positively, but noted performance gains depend on instructional design & teacher guidance.

Note. Table presents a **representative sample** of international studies reviewed; it is not exhaustive.

Table 2

Algerian Studies on Technology and CT in EFL

Authors & Year	Focus of Study	Tools / Methods	Main Findings
Zitouni (2025)	Digital portfolio assessment & implementation challenges in higher education	Digital portfolios, classroom observation, teacher/student reports	Encouraged reflective learning and evaluative judgment; however, adoption was slowed by workload, limited resources, and large class sizes, compounded by weak institutional support.
Chougrani (2023)	Portfolio use in secondary-school writing	Digital portfolios with formative feedback	Improved planning, monitoring, and self-evaluation; emphasized the value of systematic feedback integration.
Brahimi (2022)	Policy and curriculum analysis of CT in EFL	Review of national EFL textbooks and curricula	Found lack of explicit CT objectives, restricting consistent implementation of technology-based assessments.
Bouzid (2020)	Teacher perceptions of ICT for CT	Surveys/interviews with secondary-school teachers	Teachers acknowledged ICT's potential, but exam-driven practices and limited digital access restricted effective use.
Hadj Said (2025)	Media literacy and critical engagement	Classroom-based study on media literacy	Media literacy fostered critical engagement; insufficient teacher training and infrastructural issues hindered sustainability.
Bougherara (2019)	Teacher vs. learner awareness of digital tools	Teacher interviews and learner surveys	Teachers increasingly used digital tools, but learners often remained unaware of their potential for enhancing CT.
Belarbi & Bensafa	National exam and CT	Critical analysis of the EFL	Exam design emphasized linguistic accuracy over higher-order reasoning;

(2020)	assessment	Baccalaureate exam	called for assessment reform.
Guendouz & Benettayeb (2025)	Adoption of AI-powered tools in higher education	Case study on AI integration in universities	Found cautious adoption of AI tools due to concerns over reliability, ethics, and institutional readiness.

Note. Table presents a **representative sample** *of Algerian studies relevant to CT and technology in EFL education.*

5. Discussion

Globally, research underscores the educational potential of technology-based assessments in enhancing critical thinking, with studies highlighting the importance of authentic learning environments (Hung, 2019; Li & Wang, 2024), collaborative reasoning (Lu & Xie, 2019), and the effectiveness of automated scoring and formative feedback (Chen & Tsai, 2021). Nonetheless, challenges persist regarding validity, teacher preparedness, and the inconsistent responsiveness of critical thinking dimensions to digital tools (Li & Li, 2022; Aloraini, 2023; Zouari & Chen, 2023). In contrast, the situation in Algeria presents a more intricate scenario where promising practices like digital portfolios and media literacy initiatives (Zitouni, 2025; Chougrani, 2023; Hadj Said, 2025) are offset by systemic obstacles, such as exam-focused practices (Bouzid, 2020; Belarbi & Bensafa, 2020), infrastructural limitations (Zitouni, 2025), and the lack of explicit critical thinking objectives in curricula (Brahimi, 2022). Moreover, while educators recognize the importance of ICT, both global and Algerian studies agree that technology alone cannot ensure improvements in critical thinking; rather, success is largely dependent on institutional support, instructional design, and teacher training.

A synthesis of the key benefits and challenges identified across the reviewed studies is presented in Table 3 and Table 4.

Table 3

Global Context: Benefits and Challenges of Technology-Based CT Assessment

Benefits	Supporting Studies	Challenges	Supporting Studies
Provides authentic contexts for higher-order thinking (digital storytelling, WebQuests, online debates, gamified platforms).	Hung (2019); Li & Wang (2024)	Validity and reliability concerns in automated scoring/AI tools.	Chen & Tsai (2021)
Enhances collaboration, peer interaction, and collective reasoning.	Lu & Xie (2019)	Professional readiness required for teachers to design CT-focused tasks.	Li & Li (2022)
Offers efficient formative feedback through automated systems and clear rubrics.	Chen & Tsai (2021); Li & Wang (2024)	Learners' positive perceptions don't guarantee improved performance without strong instructional design.	Zouari & Chen (2023)
Improves analytical and inferential thinking via tech-mediated self-study.	Aloraini (2023)	Not all CT dimensions (e.g., evaluation, induction) respond equally well to technology.	Aloraini (2023)
Reliable measurement tools capture higher-order reasoning in writing.	Mensah & Okyere (2022)	—	—

Note. CT = Critical Thinking; EFL = English as a Foreign Language.

Table 4

Algerian Context: Benefits and Challenges of Technology-Based CT Assessment

Benefits	Supporting Studies	Challenges	Supporting Studies
Digital portfolios foster reflective learning, planning, monitoring, and evaluative judgment.	Zitouni (2025); Chougrani (2023)	Teacher workload, resource constraints, and large class sizes slow adoption.	Zitouni (2025)
ICT and media literacy promote critical engagement and	Hadj Said (2025); Bougherara	Learners often unaware of CT potential of digital tools without explicit	Bougherara (2019)

awareness of information.	(2019)	training.	
Teachers acknowledge ICT's potential for promoting CT.	Bouzid (2020)	Exam-oriented practices and limited digital access restrict implementation.	Bouzid (2020)
Portfolios and feedback integration enhance self-evaluation in writing tasks.	Chougrani (2023)	Lack of explicit CT objectives in textbooks and curricula reduces coherence.	Brahimi (2022); Belarbi & Bensafa (2020)
Emerging AI-powered tools cautiously introduced in higher education.	Guendouz & Benettayeb (2025)	Concerns about reliability, ethics, and institutional readiness limit adoption.	Guendouz & Benettayeb (2025)

Conclusion and Recommendations

This review has explored the prospects and obstacles in evaluating critical thinking in EFL using technology-based tools, focusing on both international and Algerian settings. Globally, research indicates that digital platforms like online debates, gamified activities, WebQuests, and portfolio-based assessments effectively enhance learners' higher-order thinking when paired with scaffolding, formative feedback, and teacher mediation. In Algeria, while positive outcomes have been noted with tools such as digital portfolios and media literacy practices, systemic challenges—such as rigid curricula, exam-focused teaching, inadequate infrastructure, and insufficient teacher training—continue to hinder widespread implementation.

From these findings, several recommendations arise. Pedagogically, teachers should receive ongoing professional development in assessment literacy and technology integration, enabling them to utilize digital tools not only for content delivery but also to promote reflection, analysis, and evaluation. At the curriculum level, explicit critical-thinking objectives should be incorporated into EFL textbooks and national syllabi to align classroom practices with 21st-century learning goals. Institutionally and policy-wise, increased investment in infrastructure and teacher training is crucial to create a supportive environment for technology-based assessment.

Lastly, future research should investigate longitudinal and large-scale studies in Algeria and similar contexts, as well as experimental comparisons of various digital tools, to identify scalable and

sustainable practices. In conclusion, while technology presents significant opportunities for assessing and promoting critical thinking in EFL classrooms globally, its successful integration in Algeria necessitates systemic reform, teacher empowerment, and context-sensitive adaptation. Addressing these challenges is essential to fully harness technology's potential in nurturing critical, reflective, and independent learners.

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