AI Chatbots for Critical Literacy in Education: Perspectives From UX Experts and Educators

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Abstract

This study examines stakeholder perspectives on TouriBot, an AI-supported chatbot integrated into a gamified educational application. The chatbot was implemented within "Fake News Travels Fast," a challenge-based learning environment that encourages students to critically evaluate misleading online tourism content and engage more thoughtfully with digital information. The evaluation included three stakeholder groups: in-service primary school ICT teachers, ICT educational advisors serving as institutional pedagogical experts and UX experts. The data were analyzed using Framework Analysis to identify areas of agreement and divergence among the three stakeholder groups. The findings reveal broad agreement regarding the importance of Socratic questioning, age-appropriate interaction and guided prompts in supporting student engagement and critical thinking. At the same time, participants expressed differing views concerning students' readiness to use AI-supported tools and the extent to which the chatbot should be integrated into the learning flow of the gamified environment. UX experts also identified several interaction design concerns, including visual clutter, limited contextual responsiveness and the need for supportive emotional feedback mechanisms. The study emphasizes the significance of creating AI-enhanced learning environments that foster questioning, reflection, and active assessment of digital content. The findings are valuable to the ongoing dialogue about the role of AI in education, providing practical insights for designing chatbot-assisted critical literacy activities tailored for younger learners.

Keywords: educational chatbots, critical digital literacy, gamification, primary education

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Introduction

The contemporary digital environment increasingly exposes primary school students to misleading, exaggerated, or fabricated online content. Although misinformation is not a new phenomenon, digital platforms have intensified its visibility and circulation, making it more difficult for young users to distinguish reliable information from distorted or manipulated content (Tandoc et al., 2017). This issue is especially relevant in tourism, where idealized representations of destinations are common across social media, influencer content, and travel platforms, often shaping expectations in ways that may be difficult to identify critically (Fedeli, 2020). For primary school students, whose cognitive and media literacy skills are still developing, such exposure creates a need for educational approaches that support critical interpretation, credibility assessment, and reflective engagement with online information (Potter, 2010).

In response to growing concerns about misinformation, media and news literacy education increasingly emphasizes the importance of helping students evaluate sources, question credibility, and think critically about digital content (Jones-Jang et al., 2021). However, educators often face challenges in integrating these skills into everyday classroom practice, particularly as digital and AI-supported learning environments continue to evolve (Ku et al., 2023). Gamified learning environments may offer a promising response to this challenge by combining structured learning tasks with interaction, challenge, and engagement (Deterding et al., 2011). Their motivational potential is often linked to Self-Determination Theory, which highlights autonomy, competence, and relatedness as central conditions for meaningful engagement in learning (Ribeiro Silva et al., 2024; Ryan & Deci, 2017).

This study examines "Fake News Travels Fast," a gamified educational application designed to help primary school students develop critical digital literacy through tourism-related misinformation scenarios. The application includes TouriBot, an AI chatbot that supports students as they ask questions, reflect on information, and consider whether online content is trustworthy. Educational chatbots can support communication, guidance, and learner engagement when designed to promote meaningful interaction rather than simply provide answers (Chee et al., 2023). In this context, the study explores how Information and Communication Technology (ICT) teachers, ICT educational advisors, and User Experience (UX) experts perceive TouriBot's role, usability, and educational value within a gamified learning environment.

Literature Review

As digital media grows quickly, it is changing how young people find, understand, and use information online. More and more, children come across content that is misleading, edited, or exaggerated on social media, online videos, and feeds shaped by algorithms. This problem stands out in areas like tourism, where perfect-looking images, influencer posts, and marketing stories can create unrealistic ideas and expectations (Fedeli, 2020). Misinformation has always existed in various forms, but digital platforms have made it more visible and easier to access. As a result, it is now harder for younger users to distinguish reliable information and misleading content (Tandoc et al., 2017).

In this setting, critical digital literacy is now a key goal in education. Media literacy experts say students need more than just technical skills. They also need to judge credibility,

understand persuasive messages, and think carefully about the information they find online (Potter, 2010). Recent studies show that teaching news literacy and misinformation can help students think more critically and act more responsibly online (Jones-Jang et al., 2021). However, many educators continue to report uncertainty about how to effectively integrate critical literacy skills into classroom practice, particularly in relation to rapidly evolving AI-supported technologies and digital communication environments (Ku et al., 2023).

Gamified learning environments are receiving increasing attention as effective ways to boost participation and engagement in education. Instead of just delivering information, gamification uses challenges, rewards, interaction and storytelling to help students take a more active role in learning (Deterding et al., 2011). The educational value of gamification is often linked to Self-Determination Theory, which emphasizes autonomy, competence, and relatedness as key psychological needs that influence motivation and engagement (Ryan & Deci, 2017). When integrated meaningfully into learning activities, gamified approaches may support both motivation and reflective learning practices (Ribeiro Silva et al., 2024).

Artificial Intelligence (AI) tools are now more common in education. Educational chatbots, in particular, help with communication, guidance, and personalized learning. Research shows that chatbots can boost student engagement, accessibility, and participation, especially when their conversations are designed to support learning instead of just giving answers (Chee et al., 2023). Voice-based and AI-supported chatbot systems have also demonstrated potential in supporting primary school learners through interactive educational activities (Elmaadaway et al., 2025).

Finally, recent discussions increasingly emphasize the importance of designing AI-supported educational tools that encourage questioning, reflection, and critical engagement rather than passive content consumption. In this context, conversational scaffolding and Socratic-style interaction are considered particularly important for supporting critical thinking and reflective learning processes (Paul & Elder, 2008; Vygotsky, 1978). Although interest in AI-supported learning environments is increasing, there is still not much research on how different stakeholder groups view the educational role, usability, and integration of AI chatbots in gamified critical literacy, especially in primary schools. This study aims to address this gap by looking at stakeholder perspectives on TouriBot, an AI chatbot used in a gamified misinformation-detection app for young learners.

Methodology

Research Approach

This study used participants' responses to open-ended questionnaire items. ICT teachers and ICT educational advisors were asked about three main topics: how the chatbot could better help students develop critical thinking and spot misinformation, how ready students are to use the chatbot and what affects this readiness, and what difficulties students might face when using the system. UX experts answered a mandatory question about the chatbot's conversational style, including its personality and tone, how natural its guidance felt, and how the dialogue and user engagement could be improved. We analyzed these qualitative responses to find common themes, concerns, and suggestions for improving the system's design and educational use. Data were collected through a structured questionnaire used exclusively as a vehicle for eliciting qualitative responses. No quantitative analysis of survey items was conducted; the study is entirely qualitative in orientation.

Participants

The study employed a multi-stakeholder sample comprising three distinct groups. First, ICT teachers working in primary education provided qualitative feedback through open-ended questionnaire items. Second, ICT educational advisors who support curriculum implementation and teacher development responded to the same questionnaire. Third, UX experts with experience in educational technology and interaction design were invited to evaluate the chatbot's interface, conversational flow, and overall user experience.

Data Collection

In the sample of ICT educators, the open-ended questions were optional rather than mandatory, unlike those for the other two smaller groups, the ICT advisors and the UX experts. ICT teachers could choose whether to answer the open-ended questions, since the qualitative part was meant to support, not to determine, the overall evaluation. In contrast, all ICT educational advisors and UX experts provided qualitative responses, as these were a main source of evidence. The questionnaire included three open-ended questions designed to collect qualitative data regarding: (a) ways to foster critical thinking through the chatbot, (b) the extent to which students are prepared to use it effectively and the factors influencing this and (c) potential difficulties observed during interaction with the chatbot. The qualitative analysis was conducted exclusively on the responses of participants included in the final sample (N = 112), excluding incomplete responses, failed responses to the honesty-check item and participants who did not meet the inclusion criteria for the study The ICT advisors (N = 13) answered the same mandatory questions. UX experts were asked to answer one mandatory open-ended question about the chatbot’s perceived personality, communication tone, the naturalness of the interaction, and possible improvements to the dialogue flow. All participants (N = 8) provided responses, which were analyzed thematically.

Theoretical Grounding

The three questionnaire areas were designed with reference to specific theoretical frameworks, which are elaborated below. This grounding informed both the formulation of the open-ended items and the thematic framework subsequently applied in analysis.

The first area concerned strategies for enhancing the chatbot's support of the learning process, particularly with respect to misinformation detection and critical thinking. This dimension drew on two complementary theoretical traditions. First, Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD) informed the focus on scaffolding: the chatbot was conceptualized as a mediating tool capable of supporting students in performing tasks they could not yet accomplish independently, provided that interaction is appropriately calibrated to the learner's current level of understanding (Vygotskij, 1978). Second, the Socratic and maieutic tradition of pedagogical questioning in which the teacher's role is not to transmit knowledge but to elicit and refine the learner's own reasoning provided the rationale for exploring whether and how the chatbot could adopt a dialogic rather than declarative stance (Paul & Elder, 2008). This section prompted participants to consider how the chatbot might foster critical thinking rather than simply providing ready-made answers.

The second area examined participants' perceptions of students' preparedness to interact with the chatbot. This theme was theoretically grounded in two contrasting perspectives within the literature on young learners and digital technology. Prensky's (2001) cited concept of the

“digital native” suggests that children who have grown up with digital technology possess an intuitive facility with digital tools. According to this perspective, minimal preparation may be sufficient for chatbot interaction (Prensky, 2001). However, this characterization has been substantially critiqued, as scholars argue that digital familiarity does not automatically translate into digital competence or critical engagement (Bennett et al., 2008). Potter's (2010) framework of media literacy offers a more nuanced perspective by emphasizing the cognitive and metacognitive skills required for meaningful engagement with AI-generated content, such as source evaluation, bias recognition, and reflective questioning. Consequently, the questions in this section prompted participants to consider not only students' technical readiness but also their capacity for the higher-order thinking necessary for effective chatbot use.

The third area examined potential barriers and challenges, such as technical issues, unclear instructions, and confusion arising from the chatbot's communication. This part was based on Sweller's (1988) Cognitive Load Theory, which separates cognitive load into intrinsic load (related to the content's complexity), extraneous load (related to poor instructional design), and germane load (related to building mental frameworks) (Sweller, 1988). In a gamified application for primary school students, both the game mechanics and the chatbot create cognitive demands at the same time. The questionnaire in this area asked participants to think about whether the chatbot's design might increase extraneous load, for example, through unclear prompts, unpredictable responses, or interface features that distract from the main learning task.

Qualitative data from UX experts were gathered using a required open-ended question about the chatbot’s conversational qualities. Participants were asked to assess its personality, communication tone, how naturally it guided users, and the flow of the conversation. They could also suggest ways to improve the chatbot.

Data Analysis

Qualitative data were analyzed using Framework Analysis (Ritchie & Spencer, 1994), a structured analytical method originally developed for applied policy research and particularly well-suited to studies involving multiple stakeholder groups. Framework Analysis comprises five key stages: familiarization with the data, construction of a thematic framework, indexing (coding), charting, and mapping and interpretation (*Richie Spencer Qualitative Data Analysis For Applied Policy Research*, n.d.). This approach enabled systematic comparison of perspectives across the three participant groups and facilitated the identification of both convergent and divergent themes.

Results

Analytical Framework

The following table presents the thematic framework matrix derived from the Framework Analysis, summarizing the key themes identified across the three stakeholder groups.

Table 1
Analytical Framework Matrix: Themes Across Stakeholder Groups

Theme	ICT Teachers	ICT Educational Advisors	UX Experts
Socratic & Exploratory Dialogue	Socratic questioning; suggested prompts	Active intervention in each phase	Natural dialogue flow; encourage reflection
Insufficient Integration into Learning Flow	Auto-display; mandatory use	Disconnected; overly generic responses	----
User Guidance & Scaffolding	Suggested prompts; pre-set question options	----	Suggested prompts; encouragement messages
Student Readiness & Access	Optimistic – digital natives	Cautious – metacognitive maturity required	----
Technical Failures	Not available; delay; UX input issue	----	Decorative elements cause confusion
Pedagogical Appropriateness (Ages 9–12)	Realistic scenarios; authentic sources	Information verification strategies	Lighter tone; example-based language

Convergences: Where Stakeholders Agree

Across all three groups, participants converged on Socratic scaffolding as a core design principle for TouriBot. Rather than providing direct answers or validating students' conclusions, all stakeholders agreed that the chatbot should pose guiding questions that prompt students to think critically. For example, one ICT teacher suggested that "*the chatbot could ask students questions instead of providing ready-made answers,*" while an ICT educational Advisor argued that "*TouriBot should move beyond simply providing answers and instead encourage students to question and search for the truth."* This finding aligns with established research on guided discovery learning and the role of questioning in developing higher-order thinking skills.

There was also universal approval of an age-appropriate tone for the chatbot. ICT educators, advisors, and UX experts all supported using a friendly, encouraging persona, combined with visual elements such as emojis, which were seen as suitable and engaging for children aged 9 to 12. A UX expert pointed out that "*TouriBot has a very friendly tone"* and noted that the use of emojis was *"particularly important for children aged 9–12."*

Additionally, both ICT teachers and UX experts independently recommended the inclusion of pre-set suggested question options. These were viewed as a practical mechanism for reducing student hesitation, particularly for those who struggle to formulate their own queries, while keeping interaction focused on the learning activity. As one UX expert suggested, TouriBot *"could display possible questions for students to choose from,"* a feature that could help younger users initiate dialogue more easily.

Divergences: Contrasting Priorities

A notable divergence emerged between ICT teachers and ICT educational advisors regarding student readiness. ICT teachers expressed an optimistic view, characterizing students as digital natives who are generally prepared for chatbot interaction and who require only brief

introductory instructions. ICT educational advisors, by contrast, adopted a more cautious position, arguing that effective use of the chatbot demands four distinct competencies: tool handling, task comprehension, question formulation, and critical evaluation of the chatbot's responses. This difference in perspective has significant implications for how teachers are trained to introduce the tool and how student preparation is scaffolded within the lesson.

A second divergence concerned the chatbot's integration into the gamified learning flow. ICT teachers recommended that TouriBot should appear automatically within each activity and that its use should be made mandatory, citing evidence that students tend to underuse the tool when it is optional. In contrast, ICT educational advisors, were less concerned with the frequency of use and more with the quality of the integration. As one ICT educational advisor observed, the chatbot "*...the chatbot appears too generic and disconnected from the learning process, as it does not recognize at which stage of the activity the student needs support."* This suggests a design tension between mandating engagement and ensuring that engagement is educationally meaningful.

UX Perspective: Interaction Design

UX experts offered a distinct set of observations focused on interaction design and interface usability. A key concern raised by this group was the presence of unnecessary visual elements within the chatbot interface. One UX expert summarized this concern, noting that "*the graphics are attractive, but some decorative elements may confuse users.*" Experts cautioned that decorative design features, while aesthetically appealing, can distract young users from the primary dialogue and introduce cognitive load that interferes with learning. Their recommendation was to streamline the interface in order to foreground the conversational interaction.

UX experts also emphasized the importance of emotional feedback mechanisms, recommending the use of positive reinforcement messages such as affirmations of effort to support student motivation and persistence. For example, one expert suggested adding brief encouragement messages such as *"Good effort!"* to support motivation and persistence. This recommendation is consistent with broader principles of user-centered design in educational technology, which recognize the motivational role of feedback in sustaining engagement.

From Knowledge Provider to Critical Friend

A particular theme in the data from ICT educational advisors was the recommendation to reposition TouriBot from a knowledge-providing tool to what they described as a "maieutic tool," one that draws out students' own reasoning rather than supplying answers. Rather than confirming or refuting claims about fake news scenarios, the chatbot should prompt students with questions such as "*Why do you think this source is credible*?" or *"Did you notice the missing publication date*?" This approach actively engages students' critical literacy skills and prevents the passive reception of information that can undermine the educational goals of the intervention.

Discussion

The findings of this study indicate several important dimensions of chatbot integration in gamified educational environments. The convergence around Socratic scaffolding across all three stakeholder groups suggests that there is strong professional consensus on the

pedagogical value of question-based interaction in supporting critical thinking. This is consistent with existing research on the role of guided interaction in digital learning environments and reinforces the theoretical foundation of the “Fake News Travels Fast” application.

The divergence regarding student readiness highlights a gap between educators’ experiential confidence in students’ digital competence and advisors’ more theoretically grounded concerns about metacognitive demands. This tension may reflect different professional perspectives: ICT classroom teachers observe students’ facility with digital devices on a daily basis, while ICT advisors are more attuned to the deeper cognitive skills required for meaningful critical engagement with AI tools. Bridging this gap will require more explicit pedagogical preparation, including the development of structured activities that build students’ capacity to formulate questions and evaluate chatbot responses critically.

The concern raised by both ICT educational advisors and UX experts about the chatbot's limited contextual awareness points to a fundamental design challenge. For TouriBot to serve as an effective scaffold within the gamified environment, its responses must be sensitive to the specific challenge the student is working on and to the particular misinformation scenario under investigation. Generic responses, however friendly in tone, reduce the chatbot to a decorative element rather than a functional pedagogical tool.

The UX experts’ emphasis on reducing visual noise and providing emotional feedback reflects a broader principle in educational technology design: that interface complexity should not exceed the cognitive resources available to the target user group. For primary school children, the conversational interface must be simple, predictable, and effectively supportive.

It is important to consider several limitations when interpreting the qualitative findings. Since the open-ended questions were optional for ICT teachers, the response rates for the three questions ranged from about 28% to 35%. As a result, the views shared here might not reflect the perspectives of all teachers in the sample. Those who provided qualitative feedback may have held stronger opinions or greater interest in using the chatbot for educational purposes. Furthermore, these opinions do not lead to conclusions regarding learning outcomes and do not constitute data from classroom experiments.

Conclusion

This study explored what stakeholders think about an AI chatbot used in a gamified educational setting to help primary school students develop critical literacy. Qualitative findings, based on voluntary open-ended responses from ICT teachers and mandatory responses from ICT educational advisors and UX experts revealed six main themes: Socratic and exploratory dialogue, integration into the learning process, user guidance and support, student readiness and access, technical reliability, and whether the tool is suitable for the target age group. The results show where professionals agree and where they differ, which affects how educational chatbots should be designed, used, and introduced in classrooms. The study especially points out the need for chatbots to respond to context, provide clear teaching support, and better match their features to specific learning goals. This research has some limitations. It does not include data from students, so the findings reflect only adult professionals’ views on how students might use the tool. Future research should collect feedback directly from students, utilizing both quantitative data and personal narratives to gain a clearer understanding of how TouriBot impacts learning.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The author declares that Grammarly, an AI-assisted writing software, was used in proofreading and refining the language used in the manuscript. The usage was limited to correcting grammatical and spelling errors and rephrasing statements for accuracy and clarity. The author further declares that, apart from Grammarly, no other AI or AI-assisted technologies have been used to generate content in writing the manuscript. The ideas, design, procedures, findings, analyses, and discussion are originally written and derived from careful and systematic conduct of the research.

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