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Beyond the Zoom Screen: Evaluating Technology-Enhanced Activities for Fostering Critical Thinking and Self-Regulated Learning in Online Critical Reading Class

Author's:

Rosmania Rima^{1*}; Yudi Juniardi¹;
Syafrizal¹

Affiliation:

¹Doctoral Program in Education,
Universitas Sultan Ageng Tirtayasa,
Indonesia

Corresponding email:

rosmania@untirta.ac.id

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Abstract: This qualitative study explored the impact of technology-enhanced activities on critical thinking and self-regulated learning (SRL) in an online critical reading class for English Education students. Employing a phenomenological approach, data were collected through semi-structured interviews and the analysis of student artefacts from 30 participants. Thematic analysis revealed three primary themes: (1) Enhanced Critical Thinking Through Digital Engagement, highlighting how tools like digital annotation and online discussions deepened textual analysis and fostered critical discourse; (2) Self-Regulated Learning in the Online Space, demonstrating students' use of goal setting, progress monitoring, and reflection; and (3) Perceived Challenges and Benefits of Technology Integration, which addressed both technical and logistical difficulties, as well as the flexibility and accessibility afforded by online learning. Findings indicate that strategically implemented technology-enhanced activities can significantly contribute to the development of critical thinking and SRL in online critical reading environments. The study provides practical implications for educators designing online language courses, emphasizing the importance of integrating technology to support higher-order thinking skills and self-directed learning.

Keywords: *critical thinking skills; online critical reading; technology-enhanced learning; self-regulated learning*

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Introduction

The landscape of English education has undergone a significant transformation in recent years, with online and blended learning modalities becoming increasingly prevalent (Graham & Halverson, 2022). This shift has amplified the importance of developing higher-order thinking skills, particularly critical thinking, within digital learning environments (Lionenko & Huzar, 2023). Critical reading, a cornerstone of English education, demands that students not only comprehend textual information but also analyse, evaluate, and synthesize it, skills that are crucial for academic and professional success in the 21st century (Al Roomy, 2022). However, the online environment presents unique challenges to fostering these skills, necessitating a deeper understanding of how technology can be effectively leveraged to support critical thinking development.

Furthermore, the success of online learning hinges on students' ability to self-regulate their learning processes (Sharp & Sharp, 2016). Self-regulated learning (SRL) involves students' active participation in setting goals, monitoring their progress, and reflecting on their learning experiences. In online critical reading classes, where direct teacher guidance may be limited, SRL becomes paramount for students to navigate the complexities of digital texts and engage in meaningful learning. Recent research has highlighted the intricate relationship between SRL and critical thinking, suggesting that students with strong SRL skills are better equipped to engage in critical analysis (Akcaoglu et al., 2023; Arian et al., 2022; Atmojo et al., 2023).

Despite the growing body of research on online language learning, there remains a notable gap in understanding the specific, micro-level processes through which technology-enhanced activities influence both critical thinking and SRL within the unique context of online critical reading. For instance, while studies have documented the use of digital annotation tools, they often lack detailed accounts of how students' reflective processes are altered by these tools, or how collaborative discussions contribute to the development of specific critical analysis skills. Moreover, the dynamic interplay between technology-enhanced activities and SRL in fostering critical thinking within critical reading classes has received limited attention, leaving educators without a comprehensive understanding of how these elements work together.

This study aims to address this gap by exploring how students perceive the impact of specific technology-enhanced activities on their critical thinking skills and self-regulated learning processes in an online critical reading class. Specifically, this research seeks to answer the following questions: (1) How do students perceive the impact of specific technology-enhanced activities on their critical thinking skills in online critical reading?; (2) How do students describe their self-regulated learning processes during these technology-enhanced activities? and (3) What are the perceived challenges and benefits of these technology-enhanced activities?

By employing a qualitative approach, this research seeks to provide rich, in-depth insights into the student experience, moving beyond quantitative measures of learning outcomes. The novelty of this study lies in its focus on the micro-level processes of how specific technology-enhanced activities, within the context of online critical reading, influence the development of both critical thinking and SRL, providing a nuanced understanding of their interconnectedness. This qualitative exploration offers a unique perspective, capturing the subjective experiences of students and providing valuable implications for educators designing effective online critical reading courses. The findings of this study will contribute to a deeper understanding of how technology can be effectively integrated to foster higher-order thinking skills in online English education.

1. Online Language Learning and Critical Reading

The rapid expansion of online education has necessitated a re-evaluation of pedagogical approaches in language learning (Pichugin et al., 2022). Specifically, the teaching of critical reading in online environments presents unique challenges and opportunities. While online platforms offer flexibility and accessibility, they also require students to engage with texts in a potentially less structured and more independent manner (Rawashdeh, 2021). While (Solmaz, 2020) demonstrate the use of collaborative annotation tools, their study primarily focuses on the frequency of interactions rather than the qualitative shifts in students' reading practices. Therefore, there is a need for further research that examines how these tools specifically

contribute to the development of critical reading skills, which go beyond basic comprehension to include analysis, evaluation, and synthesis (Azmuddin et al., n.d.).

2. Critical Thinking in Language Learning

Critical thinking, a fundamental skill for academic and professional success, involves the ability to analyze, evaluate, and synthesize information (Alsaleh, 2020). In the context of language learning, critical thinking is essential for students to engage with texts in a meaningful and reflective manner. Online environments can provide opportunities for students to develop critical thinking skills through activities such as online debates, collaborative problem-solving, and the analysis of digital media (Song & Cai, 2024; Thaiposri & Wannapiroon, 2015). However, educators must carefully design these activities to ensure that they promote higher-order thinking rather than simply rote memorization or information retrieval. Recent research has emphasized the importance of explicit instruction in critical thinking strategies, as well as the provision of opportunities for students to practice and apply these strategies in authentic contexts (El Soufi & See, 2019; Oroujlou & Sadeghi, 2023).

3. Self-Regulated Learning (SRL) in Online Environments

Self-regulated learning (SRL) plays a crucial role in online learning success, as students are required to take greater responsibility for their learning (Yu, 2023). SRL involves a range of cognitive, metacognitive, and motivational processes, including goal setting, planning, monitoring, and reflection (Winne & Hadwin, 2009). In online language learning, SRL is particularly important for students to manage their time, stay motivated, and engage effectively with digital resources. Recent studies have explored the use of various strategies to promote SRL in online environments, such as providing students with opportunities for self-assessment, reflection, and peer feedback (Bylieva et al., 2021; Carter et al., 2020a; Feldman-Maggor et al., 2024). Moreover, the relationship between SRL and critical thinking has been highlighted, suggesting that students with strong SRL skills are better equipped to engage in critical analysis and problem-solving (Adam et al., 2017; Jin et al., 2023).

4. Technology-Enhanced Activities for Critical Thinking and SRL

The integration of technology within online language learning environments presents a plethora of opportunities for cultivating both critical thinking and self-regulated learning (SRL). Research has highlighted the potential of several specific technology-enhanced activities in this regard. Collaborative online discussions, for instance, serve as platforms that facilitate critical discourse and the exchange of diverse ideas, thereby promoting the development of critical thinking skills (Xia & Xu, 2024). Complementarily, digital annotation tools enable students to actively engage with textual content through highlighting, commenting, and questioning, fostering deeper analysis and reflective practices (Azmuddin et al., n.d.; Lu & Deng, 2013). Furthermore, online concept mapping tools assist students in visualizing and organizing their understanding of complex concepts, contributing to enhanced critical thinking and knowledge integration. Lastly, digital portfolios have been recognized for their capacity to foster self-assessment and reflection, thereby promoting the development of SRL (Herianto et al., 2024; Lam, 2022). Each of these tools, when strategically implemented, can significantly contribute to a more effective and engaging online language learning experience. However, it is important to note that the effectiveness of these activities depends on how they are designed and implemented. Educators must carefully

consider the pedagogical goals and the needs of their students when selecting and integrating technology-enhanced activities. Furthermore, the qualitative exploration of how students experience these technologies is still needed.

Research Method

1. Research Design

This study adopts a qualitative research design, specifically a phenomenological approach. Phenomenology aims to explore and describe the lived experiences of individuals, focusing on how they perceive and interpret their world (Daruhadi, 2024). This approach is particularly suitable for this research as it seeks to understand the subjective experiences of students engaging with technology-enhanced activities in an online critical reading class and how these activities influence their critical thinking and self-regulated learning (SRL). By focusing on the "what" and "how" of students' experiences, phenomenology allows for a rich and in-depth exploration of the phenomena under investigation.

2. Participants

The online critical reading course was a 15-week semester course delivered through a combination of online synchronous (via Zoom) and asynchronous sessions (via SPADA), incorporating digital annotation and collaborative discussions via Hypothes.id digital annotation app and the discussion forum on SPADA. The 30 participants, comprising undergraduate English Education students with diverse gender distribution and varying levels of previous online learning experience, were selected through purposive sampling to ensure a diverse range of experiences. The selection criteria included: enrollment in the specified online critical reading course, demonstrated engagement with the technology-enhanced activities, and willingness to participate in semi-structured interviews.

3. Data Collection

Data collection for this study was conducted using three primary methods to ensure a comprehensive understanding of the participants' experiences. First, in-depth, semi-structured interviews were conducted with each of the 30 participants. The interview protocol, meticulously designed, aimed to delve into students' perceptions of the technology-enhanced activities employed in the online critical reading course. The protocol explored their critical thinking processes as they engaged with these technologies and their self-regulated learning (SRL) strategies. Each interview, audio-recorded to preserve the nuances of the participants' responses, was subsequently transcribed verbatim to facilitate detailed analysis. The interview questions were carefully crafted to elicit rich descriptions, focusing on specific areas such as the students' direct experiences with technology-enhanced activities, including online discussions, digital annotation, and concept mapping. Participants were asked to articulate their perceptions of how these activities influenced their critical thinking skills, prompting them to reflect on changes in their analytical and evaluative abilities. Furthermore, the interviews explored students' descriptions of their SRL processes during these activities, covering aspects like goal setting, progress monitoring, and reflection. Finally, the interviews aimed to uncover the perceived challenges and benefits associated with using these technologies, providing a balanced perspective on their impact.

Second, student-generated artefacts were collected and analysed to supplement the interview data. These artefacts, including discussion forum posts, annotated texts, and reflective journals, were gathered from all 30 participants. These materials provided tangible evidence of the student's engagement with the course content and the technology-enhanced activities. The analysis of these artefacts offered additional insights into the participants' critical thinking and SRL processes, complementing the self-reported data from the interviews. For example, the annotated texts revealed how students interacted with the reading materials, while the discussion forum posts showcased their ability to engage in critical discourse and collaborative learning.

Third, throughout the research process, the researcher maintained a reflexive journal. This journal served as a space to document the researcher's own biases, assumptions, and interpretations. Regular entries were made to reflect on the researcher's evolving understanding of the data and to identify any potential influences on the research process. This practice aimed to enhance the trustworthiness and credibility of the findings by acknowledging and addressing the researcher's subjectivity. The reflexive journal also served as an audit trail, documenting the researcher's decision-making process and providing a transparent account of the research journey.

4. Data Analysis

The data collected from the semi-structured interviews and the student-generated artefacts were analysed using thematic analysis, a method grounded in identifying, analysing, and reporting recurring patterns, or themes, within the dataset, as outlined by (Dawadi, 2020). This process commenced with a phase of thorough familiarization, wherein the transcripts of all 30 interviews, along with the collected student artefacts, were repeatedly read and re-read. This intensive engagement with the data allowed the researcher to gain a deep and nuanced understanding of the participants' experiences and perspectives. Following this, the process of initial coding was undertaken. Here, meaningful segments of data were identified and assigned initial codes, serving as concise labels that captured the essence of each segment. This coding was conducted systematically across all transcripts and artefacts, ensuring that no potential insights were overlooked. Subsequently, the initial codes were grouped into potential themes based on their similarities and relationships. This phase involved a process of iterative refinement, wherein codes were reorganized and re-categorized to develop coherent and meaningful thematic clusters. The emerging themes were then subjected to a rigorous review process, ensuring that they accurately reflected the data and captured the essence of the participants' experiences. This review involved revisiting the original data to verify that the themes were grounded in the participants' narratives and that no significant aspects had been overlooked. Once the themes were deemed to accurately represent the data, they were clearly defined and assigned descriptive names. Finally, the findings were presented clearly and coherently, utilizing rich descriptions and illustrative participant quotes to illuminate the themes and provide depth to the analysis (Lochmiller, 2021).

To enhance the trustworthiness and credibility of the findings, several strategies were employed. Triangulation was utilized by corroborating findings from multiple data sources, specifically the interviews and the student artefacts, ensuring that the interpretations were supported by convergent evidence (Figgou & Pavlopoulos, 2015). Member checking was conducted, involving the provision of summaries of the identified themes to the participants, inviting their feedback on the accuracy and completeness of the interpretations. This process

allowed participants to validate the researcher's understanding of their experiences and ensured that their voices were accurately represented. Furthermore, a detailed audit trail was maintained throughout the research process. This audit trail encompassed comprehensive records of all data collection and analysis procedures, including detailed coding memos and reflexive notes. These records provided a transparent account of the research journey, documenting the researcher's decision-making process and enhancing the rigour of the study.

Results & Discussion

This section presents the findings from the thematic analysis of the semi-structured interviews and student artefacts. Three overarching themes emerged, reflecting the participants' experiences with technology-enhanced activities in the online critical reading class: (1) Enhanced Critical Thinking Through Digital Engagement, (2) Self-Regulated Learning in the Online Space, and (3) Perceived Challenges and Benefits of Technology Integration.

1. Theme 1: Enhanced Critical Thinking Through Digital Engagement

Participants consistently reported that technology-enhanced activities facilitated their critical thinking skills. Several subthemes emerged within this theme:

a. Deepening Textual Analysis

Participants consistently reported that digital annotation tools facilitated a deeper engagement with the texts, moving beyond mere surface-level comprehension. They described how the ability to highlight and add personal notes directly onto the digital text enabled them to meticulously dissect the author's arguments and pinpoint key points. As one participant articulated, "Being able to highlight and add my notes right on the text helped me to break down the author's arguments and identify key points. I could see the structure of the text more clearly, and I could question the author's assumptions." This active engagement transformed the reading process from a passive activity to a more reflective and analytical one, as another student noted, "When I highlighted a passage, it forced me to think about why it was important. I wasn't just passively reading anymore."

Furthermore, online discussions played a significant role in fostering deeper analysis. Participants emphasized that exposure to diverse perspectives and the need to articulate their interpretations within the discussion forums contributed to a more comprehensive understanding of the texts. As one participant explained, "Reading other students' posts made me think about the text in ways I hadn't considered before," highlighting the value of collaborative learning in expanding their analytical horizons.

b. Evaluating Sources and Information

Participants consistently emphasized the crucial role of online tools in evaluating the credibility of sources, a skill they found increasingly vital in the digital age. They described actively utilizing search engines and online databases to verify information encountered during their critical reading process, and to identify potential biases that could compromise the reliability of the sources. This proactive approach to information verification was seen as a key aspect of their critical thinking development. As one student succinctly put it, "I learned how to look for reliable sources and how to recognize misinformation,"

encapsulating the sentiment that the online critical reading course equipped them with the necessary skills to navigate the complexities of digital information with a discerning eye.

c. Fostering Critical Discourse

Online discussion forums emerged as a vital platform for participants to engage in critical discourse, fostering an environment where they could challenge and defend their ideas. These forums facilitated a dynamic exchange of perspectives, encouraging students to articulate their viewpoints while also considering and responding to those of their peers. This interactive process was highly valued by the participants, particularly for its contribution to their critical thinking development. As one participant shared, "The online debates were really helpful for developing my ability to think critically and express my opinions clearly," highlighting the forums' efficacy in honing their analytical and communicative skills.

d. Visualizing and Organizing Ideas

Participants consistently indicated that the use of online concept mapping tools significantly aided their ability to visualize complex concepts and effectively organize their thoughts. These tools provided a visual representation of the relationships between different ideas, allowing students to see the interconnectedness of concepts within the texts they were studying. As one student reported, "Creating mind maps online helped me to see the connections between different ideas and to develop a more comprehensive understanding of the text." This visual organization not only facilitated a deeper comprehension of the material but also promoted a more structured and coherent approach to critical analysis.

2. Theme 2: Self-Regulated Learning in the Online Space

Participants' descriptions of their learning processes revealed the significance of self-regulated learning (SRL) in the online environment, subthemes included:

a. Goal Setting and Planning

Participants consistently emphasized the importance of setting clear goals and developing structured study plans as crucial strategies for maintaining focus and achieving success in the online critical reading course. They recognized that the self-directed nature of online learning required a proactive approach to time management and task completion. Many students found that establishing specific, measurable, achievable, relevant, and time-bound (SMART) goals helped them break down larger assignments into manageable steps. For instance, some participants created weekly schedules outlining their reading and discussion forum participation, while others set daily targets for reviewing course materials. This proactive goal-setting was often accompanied by the development of detailed study plans, which included allocating specific time slots for various learning activities. As one participant explained, "I had to be very organized and disciplined to succeed in this online class," highlighting the necessity of self-regulation and meticulous planning. Several students also mentioned utilizing digital calendars and task management applications to help them stay organized and adhere to their study plans. They found that these tools allowed them to visually track their progress, set reminders for deadlines, and prioritize

tasks effectively, further reinforcing the link between structured planning and successful self-regulated learning in the online environment.

b. Monitoring Progress and Seeking Help

Participants demonstrated a proactive approach to monitoring their progress and seeking assistance, leveraging the online tools available within the learning environment. They frequently utilized features such as progress trackers and grade books to assess their performance and identify areas requiring further attention. Online forums, particularly the discussion forum within SPADA, served as valuable platforms for seeking help. Students reported regularly checking their grades and actively engaging in the forums to pose questions and clarify concepts they found challenging. This active engagement with online resources highlighted their commitment to self-monitoring and help-seeking behaviours, both crucial components of effective self-regulated learning. As one student shared, "I would check my grades regularly and ask questions in the discussion forum if I was struggling with a concept," illustrating the direct connection between monitoring progress and seeking timely support. Furthermore, some students noted that they would use the online tracker to see when assignments were due, or how much of the course they had completed, giving them a sense of how they were doing in the course overall. This data helped them to decide when they needed to ask for help, or when they needed to focus more time on the class.

c. Reflecting on Learning

Participants consistently highlighted the significant value of reflective journaling and self-assessment in promoting their self-regulated learning (SRL). They recognized that engaging in reflective practices allowed them to consolidate their understanding of the course material and develop a deeper awareness of their learning processes. Reflective journaling, in particular, provided a structured opportunity for students to process their learning experiences, identify key takeaways, and articulate their evolving understanding of complex concepts. As one participant stated, "Writing reflections helped me to think about what I had learned and to identify areas where I needed to improve," emphasizing the role of reflection in fostering metacognitive awareness. Furthermore, self-assessment, through activities like reviewing their discussion forum posts or annotated texts, enabled students to evaluate their progress and identify areas for improvement. Some students also mentioned using the feedback they received from instructors and peers as a catalyst for reflection, prompting them to consider different perspectives and refine their analytical skills. Beyond just reviewing content, students used reflection to consider the effectiveness of their learning strategies, such as the utility of specific annotation techniques or the benefits of collaborative discussions. This metacognitive approach allowed them to adapt their learning behaviours and become more strategic learners.

d. Time Management and Organization

Time management and organization emerged as critical skills for success in the online critical reading course, with many students emphasizing their necessity. Participants frequently discussed the challenges of balancing their online studies with other commitments, such as part-time jobs, family responsibilities, and other academic coursework. They acknowledged that the flexibility of online learning, while advantageous, required a high degree of self-discipline and effective time management to avoid falling

behind. As one participant explained, "I had to create a strict schedule, or I would fall behind," illustrating the proactive measures students took to maintain control over their learning. Another student shared, "I had to plan my week out on Sunday. I would write down every assignment and every reading, and then decide what days I was going to do them. If I didn't do that, I would get overwhelmed." Some participants also mentioned using digital calendars and to-do lists to organize their tasks and set reminders for deadlines. They found that breaking down larger assignments into smaller, manageable tasks helped them stay on track and avoid procrastination. One participant noted, "I set alarms on my phone to remind me to check the discussion forums and to work on my annotations. If I didn't, I would forget, and then I would have to rush, and my work wouldn't be as good." These strategies highlighted the importance of proactive planning and organization in navigating the demands of online learning.

3. Theme 3: Perceived Challenges and Benefits of Technology Integration

While the integration of technology in the online critical reading class was largely viewed positively, participants did identify both challenges and benefits associated with its use.

a. Challenges

Technical difficulties emerged as a recurring challenge for some participants. Issues such as unstable internet connectivity, software glitches, and unfamiliarity with certain digital tools occasionally disrupted their learning process. One student recounted, "There were a few times when my internet went out, and I couldn't access the online materials or participate in the discussions. It was frustrating because I felt like I was missing out." Another participant shared, "I had trouble figuring out how to use the annotation tool at first. It took me a while to get comfortable with all the features." These technical difficulties, while not insurmountable, did present occasional obstacles that required troubleshooting and adaptation.

Time management, as previously discussed, was another significant challenge. Participants often struggled to balance their online studies with other commitments, such as work, family, and social life. The flexibility of online learning, while offering convenience, also demanded a high degree of self-discipline and organization. One student admitted, "It was hard to stay motivated sometimes, especially when I had other things going on. I had to be intentional about setting aside time for the course." Another participant shared, "I felt like I had to be 'on' all the time because the discussion forums were always active. It was hard to switch off." These challenges highlighted the need for students to develop strong time management and self-regulation skills to navigate the demands of online learning effectively.

Finally, some participants expressed a sense of isolation associated with the online learning environment. They missed the face-to-face interaction and spontaneous discussions that characterize traditional classroom settings. One student lamented, "I missed the feeling of being in a classroom with other students. It felt a bit lonely sometimes." Another participant noted, "It was harder to build relationships with my classmates online. I felt like I didn't get to know them." This sense of isolation, while not universal, underscores

the importance of incorporating opportunities for social interaction and community building in online learning environments.

b. Benefits

Despite these challenges, participants widely recognized the benefits of technology integration in the online critical reading class. Flexibility and accessibility were frequently cited advantages. Students appreciated the ability to learn at their own pace, on their schedule, and from any location with an internet connection. One participant shared, "I loved being able to study whenever and wherever I wanted. It gave me so much more freedom." Another student noted, "I could access the course materials and participate in the discussions from my phone, which was convenient." This flexibility allowed students to integrate their studies into their busy lives more seamlessly.

The ability to access a wide range of online resources was another significant benefit. Participants appreciated having access to digital libraries, research databases, and multimedia materials that enriched their learning experience. One student commented, "I found so many interesting articles and videos online that helped me understand the course concepts better." Another participant shared, "I liked being able to use online dictionaries and translation tools when I encountered unfamiliar words." This access to diverse resources broadened their learning opportunities and provided support for independent exploration.

Furthermore, participants valued the opportunity to collaborate with their peers online. The discussion forums fostered a sense of community and allowed students to engage in meaningful dialogue, exchange ideas, and learn from each other. One student remarked, "I enjoyed the online discussions. It was great to hear different perspectives and learn from my classmates." Another participant shared, "I felt like I was part of a learning community, even though we weren't physically together." This collaborative learning environment enhanced the overall learning experience and fostered a sense of shared purpose.

Finally, many participants reported increased engagement and motivation as a result of the technology-enhanced activities. The interactive nature of the digital tools and the dynamic online environment kept them actively involved in the learning process. One student enthused, "I found the online activities really great. They made me want to learn more." Another participant shared, "I felt more motivated to participate in the online discussions than I would in a traditional classroom." This increased engagement contributed to a more positive and productive learning experience.

The findings of this qualitative study provide valuable insights into the experiences of English Education students engaging with technology-enhanced activities in an online Critical Reading class. The three overarching themes that emerged—Enhanced Critical Thinking Through Digital Engagement, Self-Regulated Learning in the Online Space, and Perceived Challenges and Benefits of Technology Integration—shed light on the complex interplay between technology, critical thinking, and SRL in online language learning.

4. Enhanced Critical Thinking Through Digital Engagement

The participants' experiences, particularly their reports of deepened textual analysis, improved source evaluation, and fostered critical discourse, strongly resonate with existing research that underscores the potential of technology to enhance higher-order thinking skills (Cortázar et al., 2021). Specifically, the integration of digital annotation tools and online discussion forums provided students with dynamic opportunities to actively engage with texts and diverse perspectives, thereby promoting a more profound understanding and critical analysis. The act of annotating digital texts, as evidenced by participant feedback, facilitated a meticulous examination of authorial arguments and the identification of key points, moving beyond surface-level reading (El-Hoseiny, 2022; Petrucco & Petrucco, 2024). Similarly, online discussion forums, by exposing students to a variety of viewpoints and requiring them to articulate their own interpretations, cultivated a space for critical discourse and the development of analytical reasoning (Rathakrishnan et al., 2017; Zhang et al., 2024). Furthermore, the use of concept mapping tools played a significant role in supporting the development of critical thinking by aiding students in visualizing and organizing complex ideas. This reinforces the established notion that visual tools can effectively aid in knowledge representation and integration, enabling students to discern connections between concepts and construct a more comprehensive understanding of the subject matter (Khodadady & Ghanizadeh, 2011; Maryam et al., 2021). The ability to visually map out relationships between ideas allowed students to synthesize information and develop a more nuanced understanding of the texts being studied. These digital tools, when strategically implemented, serve as powerful catalysts for fostering critical engagement with academic content (Pellas, 2024).

5. Self-Regulated Learning in the Online Space

The findings of this study underscore the crucial role of self-regulated learning (SRL) in the context of online critical reading. Participants consistently emphasized the importance of key SRL components, such as goal setting, progress monitoring, and reflection, which align with established frameworks of SRL (Zimmerman & Moylan, 2009). The participants' narratives revealed a conscious effort to establish clear learning objectives and to develop structured study plans, demonstrating their understanding of the need for proactive engagement in the online environment. Furthermore, the need for effective time management and organization was clear in the participants' experiences. The self-directed nature of online learning necessitated a high degree of discipline and planning, highlighting the importance of providing students with explicit strategies and support to develop their SRL skills (Beach, 2017). Participants' descriptions of utilizing digital calendars, to-do lists, and time management techniques underscored their efforts to navigate the demands of the course. Moreover, the study demonstrated that students actively used the online environment to practice SRL. The use of online tracking tools, such as gradebooks and progress trackers, allowed students to monitor their performance and identify areas for improvement. Similarly, the use of online communication channels, particularly the discussion forum, facilitated help-seeking behaviours, to clarify concepts and address challenges. These findings collectively emphasize that the online environment, when coupled with appropriate tools and support, provides a fertile ground for the development and application of SRL skills (Carter et al., 2020b).

6. Perceived Challenges and Benefits of Technology Integration

The challenges articulated by participants, including technical difficulties and time management issues, are indeed consistent with commonly documented concerns in online learning environments (Culduz, 2024). However, this study's qualitative approach allowed for a deeper exploration of the nuanced nature of these challenges. For example, participants didn't just report "technical difficulties"; they described specific instances of internet disruptions during crucial discussion times or detailed frustrations with the learning platform's interface. This granular level of detail underscores the necessity for educators to move beyond generic advice and implement proactive technical support, such as readily available troubleshooting guides and on-demand assistance (Clarín & Baluyos, 2022). Similarly, the study revealed that time management wasn't simply a matter of scheduling; it involved the emotional labour of maintaining focus in a distracting home environment and the difficulty of separating "learning time" from "personal time." This highlights the need for personalized time management strategies that consider individual student circumstances and learning styles.

Conversely, the perceived benefits, particularly flexibility and accessibility, served as powerful motivators for participants. The ability to access course materials and participate in discussions at their own pace and from any location was highly valued, especially by students juggling multiple commitments (Culduz, 2024). Furthermore, the study revealed that technology integration wasn't just about convenience; it also fostered increased engagement and the development of valuable technology skills. Participants reported feeling more actively involved in the learning process due to the interactive nature of the digital tools and the dynamic online environment. For instance, the digital annotation tools allowed them to actively engage with the text, instead of passively reading. Moreover, the development of new technology skills, such as navigating online databases and using collaborative platforms, was seen as a valuable asset for their future academic and professional endeavours, contributing to the overall positive impact of technology integration (Fernández Cerero et al., 2024).

Conclusion

This study offers valuable insights into the intricate relationship between technology-enhanced activities, critical thinking, and self-regulated learning (SRL) in the context of online critical reading. By delving into the lived experiences of students, the research illuminates how digital tools, such as annotation software and discussion forums, can foster deeper engagement with texts, promote critical discourse, and support the development of essential SRL skills. The findings underscore the potential of technology to transform online learning environments into dynamic spaces where students actively construct knowledge and develop higher-order thinking skills. However, the study also acknowledges the challenges associated with technology integration, such as technical difficulties, time management issues, and the potential for social isolation. By acknowledging these challenges, the research provides a balanced perspective that informs pedagogical practices and technology development.

The implications of this study extend beyond the realm of online critical reading, offering valuable guidance for educators and technology developers across various disciplines. Educators should prioritize the strategic integration of technology-enhanced activities that actively engage students, promote critical thinking, and foster SRL. This includes providing clear instructions and ongoing support for using digital tools, creating opportunities for online discussions and collaborative learning, and incorporating SRL strategies into online courses. Technology developers, on the other hand, should focus on designing tools that are not only user-friendly but also explicitly support SRL through features such

as progress trackers and reflective prompts. By collaborating, educators and technology developers can create online learning environments that are both engaging and effective in promoting students' cognitive and metacognitive development.

While this study provides a significant contribution to the field, it is essential to acknowledge its limitations and identify avenues for future research. The qualitative nature of the study, while offering rich insights into student experiences, may limit the generalizability of the findings to broader contexts. Future research could employ mixed-methods approaches to combine qualitative and quantitative data, providing a more comprehensive understanding of the impact of technology on learning outcomes. Additionally, longitudinal studies could investigate the long-term effects of technology-enhanced activities on critical thinking and SRL, while comparative studies could evaluate the effectiveness of different technology tools and pedagogical approaches. By addressing these research gaps, we can continue to refine our understanding of how technology can be leveraged to enhance learning experiences and empower students to become self-directed, critical thinkers.

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