

# Strategies and Challenges in Encouraging Students' Critical Thinking Skills in Online Learning: A Literature Review

**Bachtiar**

Master of English Language Education, Postgraduate School, Universitas Terbuka, Indonesia

## **Abstract**

This article presents a comprehensive literature review on the methodologies and obstacles faced in fostering critical thinking skills among students within the realm of online learning. As digital education platforms become increasingly prevalent, educators and curriculum designers are tasked with the challenge of adapting traditional, interactive critical thinking exercises to virtual environments. This review synthesizes findings from various studies, including empirical research, theoretical analyses, and case studies, to identify effective strategies for promoting critical thinking in online courses. Key strategies highlighted include the use of asynchronous discussion forums to facilitate reflective thinking, the integration of problem-based learning tasks, and the implementation of peer review mechanisms to enhance analytical skills. The review also discusses the challenges encountered in online settings, such as the lack of immediate feedback, reduced social cues, and the potential for cognitive overload due to multitasking. It emphasizes the importance of thoughtful course design, the need for instructor training in online pedagogical methods, and the role of technology in supporting interactive and engaging learning experiences. Finally, the article calls for further research into innovative educational technologies and pedagogies that can better support critical thinking development in online learning environments.

**Keywords:** Critical thinking skills, online learning, information technology

## **1. Introduction**

In modern education, critical thinking (CT) is heralded as a cornerstone skill, pivotal for students' academic success and their ability to navigate the complexities of the contemporary world. Defined broadly as the ability to analyse facts, generate and organize ideas, defend opinions, make comparisons, draw inferences, evaluate arguments, and solve problems, CT transcends academic disciplines and is universally acknowledged as a critical outcome of higher education (Alsaleh, 2020). The burgeoning interest in cultivating these skills reflects a broader recognition of their value not only in academic settings but also in professional and personal spheres. Critical thinking has been identified as one of the most essential and pivotal elements in the success of education in the 21st century (Zhou et al., 2015). The logical consequence is that the ability to think critically becomes one of the fundamental objectives of education in the 21st century, recognizing the clear connection between this skill and the success of teaching and learning activities, as well as its relevance to our daily lives (Khatib & Alizadeh, 2012; Qing, 2013). (Changwong et al., 2018).

Critical thinking is the deliberate utilization of cognitive faculties, processes, and systematic strategies in decision-making (Foo & Quek, 2019). Indrašienė et al. (2021) underscore critical thinking as a cognitive process aimed at making rational decisions regarding beliefs or actions. Therefore, critical thinking involves considering and evaluating information, ultimately enabling individuals to make informed decisions. A similar definition is articulated by Goodsett (2020) stating that critical thinking is an intellectual process of conceptualizing, applying, analyzing, synthesizing, or evaluating various pieces of information obtained from observation, experience, and reflection, where the outcomes of this process serve as the basis for action. From these definitions, critical thinking emerges as a multifaceted process of understanding, perceiving, and interpreting specific information within particular contexts. Furthermore, Davies (2015) defines critical thinking as the ability to present reasoned arguments and make decisions. Critical thinking as argumentation involves discerning between valid and invalid arguments, from flawed reasoning to sound reasoning. Whereas critical thinking as decision-making arises after being compelled by arguments to make judgments and assessments. As'ari et al. (2017) express a similar notion by stating that critical thinking is a logical mode of thinking focused on decision-making. Hence, the objective of critical thinking itself is to scrutinize ideas and consider the presented thoughts.

Critical thinking constitutes a rational and reflective mode of thinking focused on believed decision-making and encompasses high-level thinking skills (Alsaleh, 2020; Indrašienė et al., 2021). Critical thinking also becomes a crucial skill required in the world of work and employment. Supriyatno et al. (2020) find that critical thinking is regarded as a vital skill highly demanded in the future job market, ranking higher than innovation knowledge or information and technology. Moreover, technological advancements alongside changes in educational and workplace environments have rendered critical thinking skills more important than ever before. In this regard, learning experiences must be designed to help students focus critical thinking skills on applicable skills across various knowledge domains.

Davies (2015) reveals that critical thinking is a necessary skill for achieving learning objectives and fostering a more dynamic teaching process. Therefore, critical thinking is generally conceptualized as an intellectual ability suitable for development by those involved in teaching. Hence, according to Alsaleh (2020), students should reflect on and apply high-level thinking. Educators must encourage students to challenge them to attain critical values, foster creativity, and meet high-level thinking requirements. In line with this, several studies have emphasized the importance of initiating the learning process with students' critical thinking skills to enhance educational quality (Goodsett, 2020). As students engage in critical thinking processes, it influences their learning abilities, speed, and effectiveness (Heong et al., 2020), enabling them to develop independent learning skills and nurture critical thinking skills. Students' critical thinking abilities can be assessed through their ability to question and respond to issues. This is crucial because critical thinking involves high-level thinking skills. Critical thinking is a rational and reflective mode of thinking focused on believed decision-making (Saleh, 2019).

The role and benefits of critical thinking abilities extend not only to students' success during education but also to their future employment and other social contexts (Fahim et al., 2014). Students with critical thinking abilities can face globalization and competition in the continuously evolving field of education. Supriyatno et al. (2020) claim that students must learn critical thinking skills, collaborative problem-solving, and effective internet technology use, both in communication and in seeking essential

information. This is because critical thinking is one of the skills required for students to address future challenges. Given the urgency and importance of critical thinking, the author agrees that critical thinking is a fundamental skill that must be fully encouraged in the current educational environment, recognizing that education plays a vital role in producing outputs capable of critical thinking.

However, fostering critical thinking in educational environments poses its own set of challenges, particularly in the context of the shifting paradigms of instruction from traditional classroom settings to digital platforms (Elfatihi, 2017; Putra dkk., 2021). The transition to online learning, accelerated by global events such as the COVID-19 pandemic, has necessitated a re-evaluation of pedagogical strategies to ensure that the development of CT skills remains at the forefront of educational objectives. This shift has prompted educators and researchers to explore innovative methodologies that can effectively engage students remotely in critical thinking activities.

The intricacies of teaching and evaluating CT skills in an online environment are manifold. The asynchronous or synchronous modes of online learning offer unique opportunities and obstacles for CT engagement (Habiburrahim, 2016). On one hand, digital platforms can facilitate a wider range of resources and interactions beyond the geographical and temporal constraints of traditional classrooms. On the other hand, the absence of face-to-face interaction and the reliance on technology-mediated communication can potentially hinder the spontaneous exchange of ideas and the nuanced feedback that are critical for developing deep analytical skills (López-Pérez et al., 2011).

The integration of CT skills into online learning is of paramount importance, as these environments become increasingly prevalent in educational systems worldwide. The flexibility and accessibility of online courses offer significant advantages, but they also require educators to adopt new pedagogical approaches. Strategies such as incorporating interactive discussions, problem-based learning, and critical reflection exercises have shown promise in engaging students in higher-order thinking processes (Carmichael & Farrell, 2012; Foo & Quek, 2019). Nonetheless, the effectiveness of these strategies in online contexts is contingent upon overcoming the challenges of creating engaging, interactive, and cognitively stimulating learning experiences remotely.

In the Indonesian educational system, the emphasis on critical thinking has gained momentum in recent years, mirroring global educational trends. The Indonesian Ministry of Education and Culture has recognized the need for a curriculum that not only imparts knowledge but also develops essential 21st-century skills, including CT. This initiative reflects a broader aim to prepare students for the demands of the global workforce and to foster a more informed and engaged citizenry. However, the implementation of CT-focused pedagogies in Indonesia's online learning environments is still in its nascent stages, with educators and policymakers grappling with how best to integrate these skills into digital platforms. The significance of CT in the Indonesian context is further underscored by the country's growing digital economy and the increasing importance of information literacy in the digital age. As Indonesian students navigate an ever-expanding digital landscape, the ability to critically assess information, engage in reflective thinking, and make informed decisions becomes increasingly crucial. Therefore, understanding how to effectively cultivate these skills in online learning environments is not only an academic concern but also a national imperative.

Despite the recognized importance of developing CT skills in online learning environments, there remains a notable gap in the literature regarding effective strategies and the specific challenges encountered in the Indonesian context. Many studies have explored CT in traditional classroom settings, but fewer have delved into its cultivation in online learning, particularly within the unique educational, cultural, and technological landscape of Indonesia. This study aims to address this gap by systematically examining existing research on the strategies and challenges of encouraging CT in online learning, with a particular focus on the Indonesian education system. By synthesizing findings from a range of studies, this review seeks to identify best practices and highlight areas where further research is needed. The ultimate objective is to provide educators, curriculum designers, and policymakers with insights into effective approaches for integrating CT into online learning, thereby enhancing the quality of education and preparing students for the complexities of the modern world.

Lebih jauh, guru menghadapi banyak kendala dalam mempromosikan CT di kelas karena kendala praktis kelas konvensional. Guru memiliki kekurangan waktu dengan siswa. Selain itu, sebagian besar pendidik sering menekankan metode yang berpusat ke guru yang memprioritaskan pembelajaran konten di atas proses pembelajaran. Bahkan pada saat kegiatan evaluasi, guru cenderung lebih memprioritaskan pengetahuan daripada proses berpikir. Akibatnya, fokus utama peserta didik adalah pada keseluruhan nilai mata pelajaran yang didapatkan (Mahhoodi-shahrehabaki - Yaghoubi-Notash, 2015). Sementara banyaknya bukti penelitian yang menunjukkan perlunya mendorong kemampuan berpikir kritis terhadap peserta didik, faktanya banyak proses pembelajaran yang dilakukan yang masih berpusat pada guru yang kurang memberikan ruang bagi peserta didik untuk mengeksplorasi ide mereka. Tulisan ini mencoba membahas hasil studi dan kajian terkait dengan upaya-upaya mendorong nilai-nilai berpikir kritis terhadap peserta didik (siswa dan mahasiswa) pada *online based learning*. Fokus tulisan ini adalah untuk mengetahui signifikansi konsep berpikir kritis yang dikaitkan dengan *online learning environment* dan tantangan yang dihadapi oleh para pengajar. Hasil kajian ini memungkinkan menawarkan beberapa pendekatan dan strategi yang memungkinkan diterapkan dalam mendorong maksimalisasi penerapan keterampilan berpikir kritis pada pembelajaran online.

## 2. Research Method

This literature review adhered to a systematic approach to identify, evaluate, and synthesize all relevant research on the strategies and challenges of encouraging CT skills in online learning, with a particular emphasis on the Indonesian education system. The methodological framework was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to ensure transparency and rigor in the review process.

The search strategy was designed to capture a broad spectrum of literature spanning empirical studies and theoretical papers related to CT in online learning environments. Databases including Scopus, Web of Science, Publish or Perish, and Google Scholar were searched using a combination of keywords and phrases such as "critical thinking," "online learning," "e-learning," "digital education," "Indonesian education system," and "21st-century skills." The search was limited to articles published in English and Bahasa Indonesia from 2000 to 2023, reflecting the period of rapid digital transformation in education.

Inclusion criteria were established to select studies that specifically addressed strategies for enhancing CT skills in online learning environments and discussed the challenges encountered in these contexts. Both quantitative and qualitative studies were considered to ensure a comprehensive understanding of the topic. Exclusion criteria included articles not directly related to CT in online learning, studies focusing solely on traditional classroom settings, and duplicate publications.

Data from the selected articles were extracted systematically, including author(s), year of publication, research design, main findings related to CT strategies and challenges, and recommendations for practice and further research. The analysis involved a thematic synthesis of the findings, with themes categorized according to the types of strategies employed to foster CT in online learning and the nature of challenges encountered. Special attention was given to studies conducted within the Indonesian context to highlight insights and implications relevant to the national education system.

### 3. Results and Discussion

Based on the outcomes of the study conducted, four main themes emerged: (1) the essence of enhancing learners' critical thinking abilities; (2) implementation and efforts to foster critical thinking skills in the learning process in Indonesia; (3) challenges in applying critical thinking in online learning; and (4) strategies to enhance learners' critical thinking abilities in online learning. These primary themes are discussed in detail in the subsequent sections.

#### 3.1 The Essence of Enhancing Learners' Critical Thinking Abilities, Including in Online Learning

Although the importance of Critical Thinking (CT) skills in the learning process is universally acknowledged, a definitive consensus on the definition of CT remains elusive (Indrašienė et al., 2021). Alsaleh (2020) characterizes CT as a process that begins with a problem and concludes with a solution and self-interpretation. Dekker (2020) echoes this sentiment, suggesting that such problems should evoke students' natural curiosity and stimulate learning and critical thinking.

Similarly, the term online learning lacks a singular definition, often used interchangeably with terms like 'e-learning,' 'distance learning,' 'virtual learning,' 'technology-based learning,' 'networked learning,' 'multimedia learning,' 'web-based learning,' 'internet-based learning,' and more. However, it is clear that online learning is a learning model where electronic technology, the internet, and/or the web are utilized and integrated into the learning process to enhance learning outcomes (Bachtiar, 2022).

Online learning, increasingly prevalent in today's educational sphere influenced by rapid technological growth, has the potential to develop students' critical thinking. It also involves educators interacting with students through online instruction, activating self-efficacy in analyzing instructions, making assessments of varied information, and seeking truth and solutions (Dhawan, 2020). Critical thinking is considered an essential attribute in the online learning environment for professional learners and for lifelong learning (Foo & Quek, 2019; Tathahira, 2020). This is crucial as learners are able to synthesize and evaluate sources of knowledge and integrate them with social network-based learning (Carmichael & Farrell, 2012). Such activities exemplify the application of critical thinking behavior. Critical thinking must be encouraged in every educational institution and online learning process to convey information and enhance organized discussion (Hew, 2016).

For a more convincing claim, Kinne dan Eastep (2017) argue that the cognitive domain of the thinking process is more conducive to being applied in online learning. Additionally, with distance learning performance leveraging internet information, educators must be critical in selecting sources (Lunney et al., 2019). The practical use in various online environments has shown that the level of critical thinking development occurs in online discussions, including web-based chats, emails, etc. (MacKnight, 2000). MacKnight further adds that online discussions have proven effective for educators to train and develop deeper and more reflective learning as they emphasize argument elements and idea exchanges.

Numerous studies have shown that online activities have a positive effect on certain academic performances of students. Concepts and behaviors associated with critical thinking values can be enhanced through online-based learning. Foo & Quek (2019) argue that the use of online interactions (web-based) can enhance learners' creativity. The accessibility, diversity, and speed of information on the internet have been extensively utilized by students to challenge themselves to refresh and produce creative ideas (Chang, 2013). Furthermore, several experts have recognized the positive impact of innovative modern learning methods on digital learning platforms at several universities. The use of digital learning platforms such as Google Classroom and Moodle is believed to assist learners in developing reasoning, problem-solving, and decision-making (López-Pérez et al., 2011). Finally, to harness these benefits, there are several approaches that need to be applied in designing online learning. Goodsett (2020) has formulated a rubric that includes several criteria for measuring the effectiveness of critical thinking activities through: (1) critical thinking teaching criteria; (2) critical thinking assessment criteria, and (3) online learning design quality assessment criteria.

Moreover, traditional methods such as face-to-face learning have been largely replaced by online classes. There are several benefits of online classrooms compared to traditional teaching practices (face-to-face classes). Through online learning, students have more time to elaborate on their answers and ideas compared to traditional classes, where students are limited by the short time available to respond. The asynchronous structure of online learning, unlike the time constraints of scheduled class periods in traditional classes, allows students to adjust the time needed for individual reflection, acquisition, and investigation. Instead of being asked to think and respond immediately to questions posed in face-to-face classes, students in online classes have the opportunity to reflect, investigate, and inquire before submitting their assignments (Goodsett, 2020; Tathahira, 2020).

Furthermore, online learning is considered more conducive to the integration of critical thinking behavior, which is reflected as active learning, compared to the interaction within the limited time frame of traditional classroom settings (Alsaleh, 2020). Distance learning can instill confidence in students to actively organize and conduct their own studies. The theoretical arguments supporting the asynchronous interaction available in online classes to promote critical thinking have focused on students' opportunities to actively process information, reflect, and delve into questions before responding (Foo & Quek, 2019). Based on these arguments, it can be stated that online learning is more popular, conducive, and compatible than traditional pedagogical methods in enhancing students' critical thinking in the current modern educational environment.

### 3.2 The implementation and efforts to encourage critical thinking skills within the Indonesian

The implementation of CT in Indonesia educational process encounters significant challenges. It is widely agreed that any school or learning environment should provide opportunities for children to express their imagination, ideas, and innovations and should contextualize their learning activities within social and cultural practices. Unfortunately, this application has not been effectively implemented in Indonesia.. Subkhan (2012) discovered that, in many cases within major cities in Indonesia, early childhood learning activities are dominated by a teacher-centered approach. Similarly, the majority of the teaching and learning processes in Indonesian schools utilize lecture methods based on rote memorization of facts, leading to less critical thinking among students (Sulaiman & Azizah, 2020). Conventional teaching methods that position the teacher as the central figure in learning are a primary reason for the low application of critical thinking values. The domination of teacher lectures during learning sessions, through continuous speaking, indirectly limits the time available for learners to develop their critical thinking abilities (Aslam et al., 2021). This evidence suggests that teaching methods in Indonesia are still dominated by conventional approaches, which will hinder students from achieving higher-level thinking processes.

Efforts to foster students' critical thinking values are often impeded by the teaching methods employed by teachers/lecturers. While some research has shown that critical thinking can be applied in almost all subjects, including Mathematics. Triyono dan Suparman (2019) claim that Mathematics is one of the subjects that can develop critical thinking abilities. Mulyani (2022) and Ilmiah (2021) support this idea by stating that critical thinking skills in mathematics learning involve a critical thinking process related to mathematical knowledge, mathematical reasoning, and mathematical proof in solving mathematical problems. However, ironically, a study released by the Trends in Mathematics and Science Study (TIMSS) on secondary school students showed that Indonesian students ranked 38th out of 42 countries in the field of mathematics (Pane et al., 2018). Furthermore, the results of the PISA 2012 survey found that Indonesian students were in 64th place out of 65 countries in mathematical literacy skills.

Similarly, in the subject of English, where proficiency and mastery of the English language also play an important role in influencing students' critical thinking. However, students face difficulties in understanding both spoken and written forms of English (Indah & Kusuma, 2016). The findings above indicate that Indonesian students mostly face difficulties not only at the arithmetic level but also at the lexical level, causing them to perform poorly in problem-solving related to opinion formation and reasoning (Hasan et al., 2013). Therefore, the overall depiction of the learning conditions described above contributes to the low implementation of critical thinking values in educational institutions in Indonesia.

### 3.3 Critical Thinking and Its Challenges in the Implementation of Online Learning

Despite its numerous benefits, incorporating and fostering critical thinking skills within online learning platforms poses significant challenges for educational practitioners, especially teachers and lecturers. This section outlines several challenges related to the implementation of critical thinking through online learning, encompassing socio-cultural, theoretical, practical, methodological, and technical issues. Firstly, critical thinking is linked to socio-cultural factors Chusni et al. (2020), indicates that Asian students, such as those from Japan, struggle to reflect the concept of critical thinking in their English writings because the Western-oriented notion of critical thinking may differ from Eastern educational cultures. Moreover,

critical thinking is not just a cultural issue but is also seldom socially taught to students. As Alsaleh (2020) notes, despite its presence in social practices, critical thinking is a challenging term to define. It represents a new way of thinking, but it should not confuse students in relation to new ways of viewing the world through novel conceptual or methodological tools for analyzing the world (Erikson, 2019).

Furthermore, a significant factor affecting the application of critical thinking is how educators can provide appropriate topics that meet the needs and understandings of critical thinking. Familiarity with the topic is seen as a supportive factor for developing reasoning skills as skills reflecting critical thinking behavior. As reflected in Stapleton (2013), research, the lack of critical thinking among Japanese ESL students in academic writing is evident when they use American topics. However, this issue is not unique to schools in Japan but also prevalent in Indonesian schools. A study by Samanhudi (2011) investigating Indonesian EFL students from a university in Banten Province found that students lacking prior knowledge or mastery of the subject matter acquired through critical reading on a topic will struggle to develop their critical thinking abilities. Therefore, teachers need to pay high attention to contextualizing and positioning themselves within the established socio-cultural values in teaching critical thinking amidst diversity.

Next, educational practitioners, including teachers, lecturers, and institutions, face challenges in designing and selecting appropriate methods and techniques for teaching critical thinking through online learning. Phirangee et al. (2016) state that the popularity of online learning has boomed in recent years, compelling teachers and lecturers to consider the best ways to design their teaching to support student learning needs and participation. Undoubtedly, some educators have yet to master the use of technology and then integrate it into learning. Ghaani dan Roslin (2021) indicate that some teachers appear unfamiliar with designing and deciding the best methods through online-based activities to promote critical thinking.

The issue becomes more complex and presents a unique challenge due to the rapid growth of online learning in higher and secondary education, emphasizing efforts to continue encouraging learners' critical thinking abilities. Challenges in developing critical thinking are exacerbated by the lack of understanding among educational providers through effective online learning techniques (Ardiasih et al., 2021; Marlin et al., 2022). The ongoing conditions technically reflect the real situation related to technology mastery for educators. Then, of course, students previously accustomed to traditional methods with teacher-centered classroom learning experiences will require more time to adapt to the new remote learning environment. Overall, educators are challenged to wisely position themselves as two-dimensional instructors who can balance between theoretically, culturally, and practically promoting critical thinking in the use of online learning.

### **3.4 Strategies for Enhancing Learners' Critical Thinking Abilities in Online Learning**

This section delineates several strategies to address the challenges faced by educational practitioners in fostering and implementing critical thinking skills through online learning. These strategies include selected methods in the teaching-learning process and other theoretical and technical approaches devised by instructors in online classrooms. Florea and Hurjui (2015) suggest that there are four primary pedagogical considerations in the implementation of e-learning: content, learning methods, practical examples, and feedback. Regarding content, it is expected that teachers and lecturers can introduce concepts of critical thinking in reading materials and assignments given to enhance students'



understanding of critical thinking. Yanning (2017) posits that tasks assigned after students read materials can influence students' critical behaviors and retain concepts in their minds. Moreover, designing online activities must be made engaging across every digital learning platform. A case study by Carmichael and Farrell (2012) utilizing 'Blackboard' as an online learning platform found that creating various levels of writing activities used as an approach can be beneficial in depicting students' critical behavior. This study also shows that the success of using online resources for student critical thinking development in higher education contexts partly depends on the students' level of development, their experience with technology use in academic activities, and their level of interest.

Importantly, teachers and lecturers as instructors play a crucial role in designing activities in online learning. This involves clarifying learning topics, keeping discussions on track, introducing opposing views to learners, assisting learners in navigating online platforms, and emphasizing good online behavior (Hew, 2015). The presence of teachers/lecturers is vital in directing discussions to become a 'critical' process. Erikson (2019) believes that when encouraging critical thinking, educators must have the ability, disposition, and motivation to differentiate discussions that need to be triggered by disagreements and further explanation of student opinions, so they will attempt to formulate their thoughts. Based on this, teachers are expected to provide explicit instructions and information through reciprocal interaction among students, even without the teacher's presence in the meeting/learning process.

The key to the success of discussion processes in developing students' higher-level thinking strategies lies in the interactive ability of educators to lead discussions (Dwyer et al., 2014; Garrett, 2013). Technically, discussions conducted by teachers in online forums or digital learning platforms are assessed as effective methods that can encourage students to behave critically. Therefore, Ricci (2013) agrees that well-designed discussion questions are fundamental in developing higher-level critical thinking skills. On this basis, Kinne and Eastep (2017) suggest that the duration of tasks given to students needs to be carefully considered by teachers. Educators must provide sufficient time and learning structure so that students can truly reflect on their thoughts, synthesize their knowledge from previous readings, and be prepared to offer their comments in both synchronous and asynchronous group discussion sequences.

Furthermore, online interaction must be smooth between students and teachers, and among students themselves. All students should be involved in group activities as an online community, and assigning group tasks can be beneficial. Ricci (2013) states that group tasks are an effective means to train and enhance students' critical thinking abilities. Moreover, Ricci asserts that peer feedback activities also stimulate students' critical thinking because each peer will prepare and anticipate their responses. This statement makes sense because group and peer activities provide opportunities for students to be open-minded, appreciate others' opinions, and to exchange, debate, and challenge arguments with one another. Changwong et al. (2018) and Marlin et al. (2022) also suggest that educators can assign meaningful projects to students as part of active learning. Projects instructed from online learning allow students to actively build new skills and experience new things through the online learning process.

However, the success of the aforementioned strategies once again depends on the ability, awareness, and elaboration of educators in the online learning setting. A study conducted by Lunney et al. (2019) reveals that specific strategies developed during online learning can enhance learners' critical thinking abilities.

Learners should be encouraged to engage in activities asking about provided health topics, for example, where from there they will argue and debate regarding essential actions to be taken to address a health issue. Furthermore, the use of Asynchronous Online Discussion (AOD) is considered as a community platform for students to encourage interaction and their critical thinking abilities (Osborne et al., 2018).

#### 4. Conclusion

In conclusion, the advancement of online learning presents both opportunities and challenges in the cultivation of critical thinking skills among learners. The strategies outlined in this article, ranging from the thoughtful design of content and tasks to the facilitation of interactive discussions and the integration of group projects, underscore the multi-faceted approach required to effectively foster critical thinking in digital educational environments. It is evident that the role of educators is paramount in this endeavor, as they must navigate the complexities of online platforms to create engaging, reflective, and intellectually stimulating learning experiences. The success of these strategies is contingent upon educators' ability to adapt pedagogical practices to the online context, leveraging technology not just as a medium of instruction, but as a tool for enhancing critical analytical skills, fostering collaborative learning, and promoting a deeper understanding of subject matter.

Moreover, the findings emphasize the importance of continuous adaptation and innovation in educational methodologies to meet the evolving demands of online learning landscapes. As educators and learners alike navigate these digital environments, the emphasis on critical thinking skills becomes more crucial, serving not only as an academic objective but as a fundamental component of lifelong learning and informed citizenship. The challenges identified, from socio-cultural barriers to technological constraints, highlight the need for ongoing research and development in online pedagogical strategies. Ultimately, the collective effort to enhance critical thinking through online learning will contribute significantly to preparing students for the complexities of the modern world, equipping them with the intellectual tools necessary to navigate, analyze, and contribute meaningfully to the ever-changing global landscape.

#### References

1. Alsaleh, N. J. (2020). Teaching Critical Thinking Skills : Literature Review. *The Turkish Online Journal of Educational Technology*, 19(1).
2. Ardiasih, L. S., Yundayani, A., & Juhana, J. (2021). Teachers' Readiness to Online Learning: A Pedagogical Perspective. *ASEAN Journal of Open and Distance Learning*, 4(2), 105–117. <https://doi.org/https://doi.org/10.1007/s10639-022-10336-7>
3. As'ari, A. R., Mahmudi, A., & Nuerlaelah, E. (2017). Our prospective mathematic teachers are not critical thinkers yet. *Journal on Mathematics Education*, 8(2). <https://doi.org/10.22342/jme.8.2.3961.145-156>
4. Aslam, R., Khan, N., Asad, M. M., & Ahmed, U. (2021). Impact of technological pedagogical content knowledge on teachers' digital proficiency at classroom in higher education institution of Pakistan. *Interactive Technology and Smart Education*, 18(1), 119–130. <https://doi.org/10.1108/ITSE-11-2020-0222>
5. Bachtiar, B. (2022). The Interplay between Online Learning and Students' Learning Motivation: A Mixed Method Study. *Jurnal Basicedu*, 6(3), 4701–4711. <https://doi.org/10.31004/basicedu.v6i3.2902>

6. Carmichael, E., & Farrell, H. (2012). Evaluation of the Effectiveness of Online Resources in Developing Student Critical Thinking: Review of Literature and Case Study of a Critical Thinking Online Site. *Journal of University Teaching and Learning Practice*, 9(1), 38–55. <https://doi.org/10.53761/1.9.1.4>
7. Chang, Y. S. (2013). Student technological creativity using online problem-solving activities. *International Journal of Technology and Design Education*, 23(3). <https://doi.org/10.1007/s10798-012-9217-5>
8. Changwong, K., Sukkamart, A., & Sisan, B. (2018). Critical thinking skill development: Analysis of a new learning management model for Thai high schools. *Journal of International Studies*, 11(2), 37–48. <https://doi.org/10.14254/2071>
9. Chusni, M. M., Saputro, S., Suranto, & Rahardjo, S. B. (2020). Review of critical thinking skill in Indonesia: Preparation of the 21st century learner. In *Journal of Critical Reviews* (Vol. 7, Issue 9). <https://doi.org/10.31838/jcr.07.09.223>
10. Davies, M. (2015). *A Model of Critical Thinking in Higher Education*. [https://doi.org/10.1007/978-3-319-12835-1\\_2](https://doi.org/10.1007/978-3-319-12835-1_2)
11. Dekker, T. J. (2020). Teaching critical thinking through engagement with multiplicity. *Thinking Skills and Creativity*, 37. <https://doi.org/10.1016/j.tsc.2020.100701>
12. Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis: <https://doi.org/10.1177/0047239520934018>, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
13. Dwyer, C. P., Hogan, M. J., & Stewart, I. (2014). An integrated critical thinking framework for the 21st century. *Thinking Skills and Creativity*, 12(3), 43–52. <https://doi.org/10.1016/J.TSC.2013.12.004>
14. Elfatih, M. (2017). A Rationale for the Integration of Critical Thinking Skills in EFL / ESL Instruction. *Higher Education of Social Science*, 12(2), 26–31. <https://doi.org/10.3968/9702>
15. Erikson, M. G. (2019). Supporting critical thinking in higher education: Consideration for strategic discussions. *Paper Presented at the 2019 European Learning & Teaching Forum of European University Association, University of Warsaw, Warsaw.*, 23–35.
16. Fahim, M., Miri, M., & Najafi, Y. (2014). Contributory Role of Collaborative Assessment in Improving Critical Thinking and Writing. *International Journal of Applied Linguistics and English Literature*, 3(1), 1–11. <https://doi.org/10.7575/AIAC.IJALEL.V.3N.1P.1>
17. Florea, N. M., & Hurjui, E. (2015). Critical Thinking in Elementary School Children. *Procedia - Social and Behavioral Sciences*, 180(5), 565–572. <https://doi.org/10.1016/j.sbspro.2015.02.161>
18. Foo, S. Y., & Quek, C. L. (2019). Developing Students' Critical Thinking through Asynchronous Online Discussions: A Literature Review. *Malaysian Online Journal of Educational Technology*, 7(2).
19. Garrett, M. L. (2013). An Examination of Critical Thinking Skills in High School Choral Rehearsals: *Journal of Research in Music Education*, 61(3), 303–317. <https://doi.org/10.1177/0022429413497219>
20. Ghaani, M., & Roslin, V. P. (2021). *A Study on the Knowledge, Attitude, and Practice of Critical Thinking Skills among EFL Teachers in Iran*. 3(2), 14–24. <https://doi.org/10.47176/kurmanj.3.2.14>

21. Goodsett, M. (2020). Best practices for teaching and assessing critical thinking in information literacy online learning objects. *Journal of Academic Librarianship*, 46(5). <https://doi.org/10.1016/j.acalib.2020.102163>
22. Habiburrahim, H. (2016). The Internet and ICT: Opportunities or Threats to the Education World? *Englisia Journal*, 3(1). <https://doi.org/10.22373/ej.v3i1.533>
23. Hasan, S., Tumbel, F. M., & Duran Corebima, A. (2013). Empowering Critical Thinking Skills in Indonesia Archipelago: Study on Elementary School Students in Ternate. *Journal of Modern Education Review*, 3(11).
24. Heong, Y. M., Ping, K. H., Hamdan, N., Ching, K. B., Yunos, J. M., Mohamad, M. M., Jiar, Y. K., & Azid, N. (2020). Integration of learning styles and higher order thinking skills among technical students. *Journal of Technical Education and Training*, 12(3 Special Issue). <https://doi.org/10.30880/jtet.2020.12.03.018>
25. Hew, K. F. (2016). Promoting engagement in online courses: What strategies can we learn from three highly rated MOOCS. *British Journal of Educational Technology*, 47(2). <https://doi.org/10.1111/bjet.12235>
26. Ilmiah S., H. (2021). Critical-thinking Perspective in the Level C2 Sahabatku Indonesia Books. *KnE Social Sciences*. <https://doi.org/10.18502/kss.v5i3.8533>
27. Indah, R. N., & Kusuma, A. W. (2016). Factors Affecting The Development of Critical Thinking of Indonesian Learners of English Language. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*, 21(6).
28. Indrašienė, V., Jegelevičienė, V., Merfeldaitė, O., Penkauskienė, D., Pivorienė, J., Railienė, A., Sadauskas, J., & Valavičienė, N. (2021). Linking critical thinking and knowledge management: A conceptual analysis. *Sustainability (Switzerland)*, 13(3). <https://doi.org/10.3390/su13031476>
29. Khatib, M., & Alizadeh, I. (2012). Critical Thinking Skills through Literary and Non-Literary Texts in English Classes. *International Journal of Linguistics*, 4(4), 563–580. <https://doi.org/10.5296/ijl.v4i4.2928>
30. Kinne, L., & Eastep, S. M. (2017). Instructional Design in Online Learning : Components of Quality. *Kentucky Journal of Excellence in College Teaching and Learning*, 6(2008), 45–58.
31. Kohzadi, H., Azizmohammadi, F., & Samadi, F. (2014). Is there a relationship between critical thinking and critical reading of literary texts: A case study at Arak University (Iran). *International Letters of Social and Humanistic Sciences*, 22, 63–76. <https://doi.org/https://doi.org/10.18052>
32. López-Pérez, M. V., Pérez-López, M. C., & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers and Education*, 56(3). <https://doi.org/10.1016/j.compedu.2010.10.023>
33. Lunney, M., Frederickson, K., Spark, A., & McDuffie, G. (2019). Facilitating Critical Thinking Through Online Courses. *Online Learning*, 12(3–4). <https://doi.org/10.24059/olj.v12i3-4.1686>
34. Macknight, C. (2000). Teaching critical thinking through online discussions. *Educause Quarterly*, 4.
35. Mahmoodi-shahrehabaki, M., & Yaghoubi-Notash, M. (2015). Teachers' and Learners' Attitudes towards Critical Thinking Skills: A Case Study in the Iranian EFL Context. *Journal of Applied Linguistics and Language Research*, 2(2), 93–106. <https://doi.org/https://doi.org/10.1179/1077800412451375>

36. Marlin, Saehu, A., & Yundayani, A. (2022). Investigating Students' Language Learning Strategies during Online Learning: How They Deal with Speaking Ability. *JEELS (Journal of English Education and Linguistics Studies)*, 8(2), 229–261.
37. Mulyani, A., Y. (2022). Pengembangan Critical Thinking Dalam Peningkatan Mutu Pendidikan di Indonesia. *DIAJAR: Jurnal Pendidikan Dan Pembelajaran*, 1(1). <https://doi.org/10.54259/diajar.v1i1.226>
38. Osborne, D. M., Byrne, J. H., Massey, D. L., & Johnston, A. N. B. (2018). Use of online asynchronous discussion boards to engage students, enhance critical thinking, and foster staff-student/student-student collaboration: A mixed method study. *Nurse Education Today*, 70. <https://doi.org/10.1016/j.nedt.2018.08.014>
39. Pane, N., Syahputra, E., & Mulyono, M. (2018). Improving the Ability of Creative Thinking Mathematically and Self-Confidence Student through Application Model Eliciting Activities (MEAs) Review from Student Gender. *American Journal of Educational Research*, 6(4). <https://doi.org/10.12691/education-6-4-4>
40. Phirangee, K., Epp, C. D., & Hewitt, J. (2016). Exploring the relationships between facilitation methods, students' sense of community, and their online behaviors. *Online Learning Journal*, 20(2). <https://doi.org/10.24059/olj.v20i2.775>
41. Putra, R. A. A., Riwayatningsih, R., & Setyarini, S. (2021). Portraying Teacher's Metacognitive Knowledge to Promote EFL Young Learners' Critical Thinking in Indonesia. *International Journal of Language Education*, 5(1), 552–568. <https://doi.org/10.26858/IJOLE.V5I1.13043>
42. Qing, X. U. (2013). Fostering Critical Thinking Competence in EFL Classroom. *Studies in Literature and Language*, 7(1), 6–9. <https://doi.org/10.3968/j.sll.1923156320130701.2717>
43. Ricci, F. A. (2013). Encouraging critical thinking in distance learning: ensuring challenging intellectual programs. *Distance Learning VO - 10*, 10(1).
44. Saleh, S. E. (2019). Critical Thinking as A 21st Century Skill: Conceptions, Implementation and Challenges in the EFL Classroom. *European Journal of Foreign Language Teaching*, 4(1), 1–16. <https://doi.org/10.5281/zenodo.2542838>
45. Samanhudi, U., & S. P. (2011). Researching students' critical thinking in EFL writing class (A case study in English Education Department, Untirta). *TEFLIN 57th Revitalizing Professionalism in ELT as a Response to Globalized World.*, 1–14.
46. Stapleton, P. (2013). Assessing critical thinking in the writing of Japanese university students: Insights about assumptions and content familiarity. *Written Communication*, 18(4), 67–81. <https://doi.org/10.1177/0741088301018004004>
47. Subkhan, E. (2012). Paradigm Shifts on Educational Technology and its Possibilities for Transformative Action. *The First International Conference on Current Issues in Education (ICCIE)*. [https://www.researchgate.net/publication/335755742\\_Paradigm\\_Shifts\\_on\\_Educational\\_Technology\\_and\\_its\\_Possibilities\\_for\\_Transformative\\_Action](https://www.researchgate.net/publication/335755742_Paradigm_Shifts_on_Educational_Technology_and_its_Possibilities_for_Transformative_Action)
48. Sulaiman, A., & Azizah, S. (2020). Problem-Based Learning to Improve Critical Thinking Ability in Indonesia: A Systematic Literature Review. *Jurnal Pedagogik*, 07(01).
49. Supriyatno, T., Susilawati, S., & Hassan, A. (2020). E-learning development in improving students' critical thinking ability. *Cypriot Journal of Educational Sciences*, 15(5). <https://doi.org/10.18844/CJES.V15I5.5173>

50. Tathahira, T. (2020). Promoting students' critical thinking through online learning in higher education: Challenges and strategies. *Englisia: Journal of Language, Education, and Humanities*, 8(1), 79–92. <https://doi.org/10.22373/EJ.V8I1.6636>
51. Triyono, A., & Suparman. (2019). Inquiry-based worksheet design to improve critical thinking of students in Indonesia. *International Journal of Scientific and Technology Research*, 8(10).
52. Yanning, D. (2017). Teaching and Assessing Critical Thinking in Second Language Writing: An Infusion Approach. *Chinese Journal of Applied Linguistics*, 40(4), 431–451. <https://doi.org/10.1515/CJAL-2017-0025>
53. Zhou, J., Jiang, Y., & Yao, Y. (2015). The investigation on critical thinking ability in EFL reading class. *English Language Teaching*, 8(1), 83–94. <https://doi.org/10.5539/ELT.V8N1P83>