

INFUSING DIGITAL TECHNOLOGY IN CRITICAL LITERACY PEDAGOGY TO GENERATE CRITICAL THINKER

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Abstract

Traditional skills such as literacy and numeracy skills, added with learning and innovation skills, career and life skills, and digital literacy skills are called the new learning paradigm. Those skills also align with the challenge for higher education institutions to develop curricula in the 4.0 industry era to produce graduates who have 21st-century skills, that is HOTS (high-order thinking skills), which covers communication, collaboration, critical thinking, creative thinking, computational logic, compassion, and civic responsibility. Students are digital natives, but technology implication limits their cognitive thinking potential when they depend too much on it that avoid thinking enhancing, discovering information, and problem-solving steps. Those constraints challenge teachers to emerge the student's critical thinking abilities. This research aims to propose critical literacy using digital technology in shaping students to be critical thinkers and to promote that digital literacy is essential to ensure that technology is merely a support, not a substitute for teachers to achieve quality teaching practice. The research method is a case study since it produces an in-depth, multifaceted understanding of a complex problem in the actual setting of integrating technology and critical thinking skill. Infusing digital technology in critical literacy is essential to emerging critical thinking awareness since both are needed in the workforce. Packaging technology as a device to nurture students' critical thinking in language instruction will help students select, gather, analyze, and evaluate effectively the extravagance of information in cyberspace.

Key words: digital technology, critical literacy, critical thinking

Introduction

Digital Technology and Critical Literacy as the 21st Century Need

In a comparison of 21st-century education, the 20th differs significantly. As technologies have been arising, there is an increasing demand for career capacities and 21st-century skills at schools. Tasks that were previously done often by people are now completed with advanced computers and analytical skills. Furthermore, work that was conducted independently by an individual, is now performed more by involving a lot of people as a group, which requires today's students to hone their collaborative skills (Vanada, 2016). Compared to 20th-century learning, 21st-century skills encourage students to invent creation and solve complex problems as an implementation of their skill sets (Kereluik et al., 2013). However, learners in the 21st

century can pursue education through online learning, and they may be able to interact as if they were in a traditional classroom setting in front of their devices. Giving students what they need to succeed in their new world, as well as helping them gain the confidence to use those skills, is the core of 21st-century education. With so much information at their fingertips, 21st-century talents focus on making sense of it, sharing it, and putting it to good use. As a result, 20th-century education is teacher-centered with a fragmented curriculum and students memorizing knowledge in isolation. While 21st-century education is student-centered with real-world relevant collaborative, project-based learning. The 21st century skills also demands students to have HOTS (high-order thinking skills) which cover communication, collaboration, critical thinking, creative thinking, computational logic, compassion,

and civic responsibility (Junaidi et al., 2020).

Technology use has increased recently all over the world. Since the 20th century, educational institutions had already struggled to apply digital technology in teaching and learning to figure out the effectiveness of technical innovations, i.e., video, audio recording, email, and teleconference to support the conventional teaching method. However, in the last two decades, this challenge is getting more complicated because of the new technology and sheer volume on the market. From 2008-2015, the number of active applications in Apple's App store rose from 5.000 to 1.75 million (Schindler et al., 2017). Nowadays, in 2023, the statistics report that the Apple App Store has 1.96 million apps that are available for download, there are 2.87 million apps available for download on the Google Play Store, 21% of millennials open an app 50 times more per day, 49% of people open an app 11 times more each day, 70% of all US digital media time comes from mobile apps, and the average smartphone owner uses 10 apps per day and 30 apps each month (Buildfire.com., 2023). Results from the 2015 PISA survey show that, on average, 95 percent of 15-year-old students in OECD nations had access to the Internet at home (OECD, 2017). Additionally, students spent more than 10 hours online on a typical weekday, an increase of 40 minutes since 2012 (OECD, 2017). Children are "connected" in more than just the home environment. According to PISA 2012 data, 72% of students in OECD countries reported using computers at school, compared to 93% at home (desktop, laptop, or tablet computers) (OECD, 2015).

Students are digital natives (Janschitz & Penker, 2022; Prensky, 2001), but technology implication limits their cognitive thinking potential when they depend too much on it that avoid thinking enhancing, information discovering, and problem-solving (Shyamlee and Phil,

2012). Those constraints challenge teachers to emerge the student's critical thinking ability. Students will be better able to choose, gather, analyse, and evaluate the abundance of information available online if technology use and critical thinking are integrated into language learning. The extensive use of digital platforms in language instruction, including software, applications, websites, and machine learning, will help students develop their critical thinking skills. Giving that both are required in the workplace. Infusing technology into critical literacy is crucial to the development of critical thinking awareness. This study aims to propose the use of digital technology to foster critical thinking in students and to advocate for the importance of digital literacy in ensuring that technology is used as a tool to support teachers rather than as a replacement for them in order to carry out effective teaching practices.

New Teaching Paradigm

To succeed in the 21st century, we must have literacy and numeracy skill, as well as the skill to think logically and solve problems effectively and independently (Kivunja, 2014). Referring to 21st century skills, Kivunja (2015) proposes a traditional core skill, added with the learning and innovation skills, the career and life skills, and the digital literacies skills, which he calls the new learning paradigm. The learning and innovation skills include 4C skills (communication, collaboration, critical thinking, and creativity) which is important for students in order to overcome the global challenges (Junaidi et al., 2020; Kembara et al., 2019). To face the 21st century problems and suit the needs of the industrial era 4.0, it is required for the students to have the ability to think HOTS (High Order Thinking Skills). The ability needed by students in the career world of the 21st is demonstrated in interpreting the language in the text and further exploring by looking at the context of the circumstance, institution, or culture,

which aligns with the suggested learning outcomes created for graduates. The 21st-century skills that foster HOTS (high-order thinking skills) are communication, collaboration, critical thinking, creative thinking, computational logic, compassion, and civic responsibility (Junaidi et al., 2020). The importance of high-order thinking skills is also conveyed by Vozgova and Afanasyeva (2020) who claim that global and rapid developments require the workforce to have analytical thinking skills and active learning, such as critical thinking, ability to influence and negotiate, flexibility, and problem-solving. So, education must be given to them since childhood to prepare young citizens for the workplace, supported by the skill they need to be active and responsible individuals.

Career and life skills is the 2nd competence that students need to develop their skills and abilities. The career and life skills are needed because in the 21st-century, life and work environments are competitive and complex. To prepare the students for success in the digital economy, they need to be taught skills as they need far more than simple thinking skills and an understanding of content knowledge. Kivunja (2015) identifies five elements that construct career and life skills, namely flexibility and adaptability skills, initiative and self-directions skills, social and cross-cultural skills, productivity and accountability skills, and also leadership and responsibility skills.

The third skill of the 21st-century skills is digital literacy skills which includes the information, media, and technology. They are each concerned with a different element of digital comprehension. Digital literacy skill focuses on the student's ability to discern facts, publish outlets, and the technologies as a whole behind them. It helps the students to determine the reliable facts among the extravagance of information in cyberspace. Under the digital literacy skills is information literacy. Information

literacy is a foundation skill and the ability to find evaluate, organize, and understand the information accurately that matches the needs (Swain et al., 2014). It teaches them to separate fact from fiction and how to use reliable information properly to avoid being misled by chronic misinformation. The next one is media literacy. Media literacy is understanding the methods and outlets in which information is published. Media literacy is the practice of identifying useful content and avoiding unwanted content that is offered by the media (Khlaisang & Koraneekij, 2019). Just like the previous skill, media literacy is helpful for finding truth in a world that is saturated with information. Through this skill, students can identify which sources of information are reliable and trustworthy. Lastly, under the digital literacy skill is technology literacy. Technology literacy is the ability to use digital technology to access, manage, and evaluate the information for learning (Khlaisang & Koraneekij, 2019). Technology literacy gives students the basic information they need to understand what gadget performs, what tasks, and why. It unmask the high-powered tools that won today's world in which, as a result, students can adapt to the world more effectively. They can play an important role in its evolution.

Critical Literacy Pedagogy

In order to encourage students to engage in critical thinking, problem-solving, and action in the social environment in their lives, critical literacy is a method of reading the world and the written word as a teaching method. The ability to critically and analytically understand texts enables readers to read texts from a variety of points of view, focus on sociopolitical issues, act on texts they have read, and find their own voice and ethical responsibility to improve the world. Critical literacy is the ability to understand texts critically and analytically (Beck, 2005, as cited in Abdenia, 2015). Some steps to implement a critical literacy approach to teach L2 reading in English as

a Foreign Language (EFL) or English as a Second Language (ESL) context are proposed by Abdenia (2015). The first is familiarizing learners with critical literacy. Teachers may provide simple and short reading discussing critical literacy. Students must be put as an active learners, against the conventional reading, in that the class must be managed in critical manner by questioning students' reading habits and assisting them to reflect their own or others' reading habits and continue to build the initial questions that relate and lead critical thinking. The second step is negotiating reading, which means engage students to pick their choice of text that relevant and significant to students' lives. Next step is asking critical questions. Due to the main purpose of teaching critical literacy is emerging learners' awareness to be critical thinker, teachers provide questions to encourage students to express their opinion and explore their perception of the text to foster learners' ability to analyze the text critically. Step four proposes discussing question collaboratively. Critical discussion elevates students' awareness of real life problems, establishes and maintenances of justice of the diversity among students. The fifth implementation is writing reflective journal. Reflection assists students raise the understanding of the world and how they behave and take action within through analyzing the individual experiences, critiquing the information using their beliefs and experiences, and thinking on how our lives and the environments in which we live and work relate to the experiences and attitudes of others. Along with encouraging critical reflection in L2 learners through group discussions, reflective journal writing also gives students consideration of their own opinions as well as other opinions of their peers, teachers, and authors.

Methodology

The method of this research is case study since it produces an in-depth, multifaceted understanding of a complex problem in the actual setting of integrating technology and critical thinking skill. The object of the research was taken from Discourse Analysis class on the 4th semester students of English Literature in 2022/2023 academic year at Universitas AKI in Semarang, Central Java. The considerations of the chosen object were discourse analysis class explored more to the written text, as the main source of critical literacy, and the students were considered to be critical thinker since in discourse analysis class students learnt to analyse the text critically.

The methods of data collection were observation and artefacts. Observation was the systematic noting and recording of first-hand information. These observations could take the form of events, behaviours, and objects. In this study, the researcher also took the role as the class teacher during the participatory observation. Artefacts in this study referred to any written works that were produced during instructions either in class (worksheets and discussion notes) or out of class (assignments). The documents, then, could also be referred as class artefacts. The data in these documents included students' answers to questions, students' questions, and summaries/reviews. The method of data analysis examined the data by getting an explanation of students' responses to questions or students' reason for asking certain questions and students' artefacts that indicated their engagement in critical literacy.

Finding From Traditional to Digital Literacy Learning

With the rapid development of innovative technologies, education systems and institutions are moving from traditional teaching methods to online and digital methods. The learning sources that is used as teaching is not only printed

textbook, but also sources in the digital devices, or the sources are textbook added by other sources in digital platform, although in some cases, textbook is used mostly in primary school. Students have been familiar enough with digital technology, as they are digital natives that spend most of their time with digital devices. Due to their familiarity and interest with the tool, exploring teaching sources using digital technology may be effective in language instruction. All data are taken from digital technology platforms, such as news in website, YouTube or chatting in Facebook, WhatsApp, Instagram or any other social media related to the topic. The platform provides abundance of information to be analyzed critically and up-to date information which is a fresh-from-the-oven talk.

Teachers play a crucial role in implementing technology so that students can learn anything, anytime, anywhere, and regardless of place or time. Teacher uses blended learning with Learning Management System (LMS) to make students do a preparation before face-to-face meeting. Teacher shares the instruction of certain topic to students, so they can find the topic from any sources. During the class, for presentation and brainstorming, students will discuss a topic using PPT or showing video from YouTube or Instagram, or any social media to support their perception of certain topic or maybe they show their own video from their smartphone related to the topic. In addition to writing on the whiteboard and displaying their work, students can also watch and discuss each other's video recordings in other groups. At the end of the class, learning can be conducted by writing reflective journals. Students re-examine the topic based on their own perspective or they make their own article according to their point of view or it is called a meaning maker. In this last phase of critical literacy exploration, students will gain social

awareness through projects like helping other students, contributing to magazines and new publications, and engaging in new activities.

Infusing Digital Technology in Critical Literacy Learning

Since the traditional method of teaching reading is still implemented in the majority of educational institutions, teachers are unable to directly teach students critical reading as the new method of reading, but they may begin to combine both. The first new method is negotiating reading. Students are engaged to negotiate text that relevant to students' daily life. Before starting teaching critical literacy, teacher asks students to give an idea of topic that will be discussed. The top most topic from female students are K-pop, gossip, anime, film, and song. Meanwhile for male topic, they prefer to pick games, soccer (U 20 National Team), recent viral topic, and song. After identifying the most attractive topic, then teacher picks one topic and questions students about their preferences. To encourage student involvement, teacher asks a simple question to students related to the interesting topic that they have chosen earlier.

Another way to emerge the critical thinking awareness is teacher provides short and simple text of critical literacy to initiate reading text critically for example meme taken from website. Meme is considered to be chosen data because usually it consists of a few sentences only and it is a simple text. In teaching critical literacy, educators should teach flexibility in order students can think critically and analytically. So, the sources that are taken as data are authentic material, since it relates to students' daily life.

This preliminary step leads to the more complex questions that will emerge the students' critical thinking awareness. Teacher leads students to the gender discussion by showing the picture of woman that is sweeping the floor,

gossiping, and crying from website. Power Point presentations, websites, movies, audio recordings, and images are all acceptable teaching and learning tools that teachers may use. She asks students to share what they think about looking at the picture such as why the image is woman or why should woman do that. After this warmup activities, teacher asks students to find the data related to gender using their smartphone. The data that students found are: (1) Women in strike holding a pamphlet with the words: Don't tell me to dress! Tell them not to rape!!!, (2) Police investigation to the victim of the rape case: *Pakaianmu saat itu seperti apa* (how did you dress)? (3) *Melawan stigma perempuan "Perebut laki orang"* (fight woman stigma as mistress), (4) Picture of man who is crying and wearing pink shirt with the words: *laki-laki kok nangis* (why does the man cry), *kok bajunya warna pink* (why is the dress pink)?, (5) *Kalau perempuan boleh kuat, kenapa laki-laki tak boleh lemah* (if woman is allowed to be strong, why can't man to be weak)? From those texts, students speak up about woman and man stereotype. They consider that woman is weak, emotional, to be blamed, and woman is positioned as an object, meanwhile man stereotype is strong, rational, superiority, symbol of power, and he takes domination of the rule in society.

In discussion session, teacher then gives another question to raise the students' awareness of different perspective, such as why mum does all the housework, how if mum has higher income than dad, how if dad does not work and just stay at home do the housework and caring the kids, or how if dad being a househusband. Teacher may also ask students to respond a critical question such as: can you think of another example of stereotype? Students may find the sources from website, or YouTube or any other sources supporting their point of view. After that, they have to express

their perspective. Their opinion are: a man is stronger than woman, but actually the case is just an assumption, because not all women is weaker than man. It can raise discrimination between man and woman. But in reality, there are many job vacancy that require man for certain occupation that need powerful force, such as director, manager, or technician. Another respond is: most people said that Sundanese women are usually materialistic. So, most Javanese mother do not allow her son to marry Sundanese girl because of that stereotype. But I think this is just stereotype, because not all Sundanese women have that character. Other said: Javanese think that Medanese is a rude people, because they talk loudly. But in fact it is just kind of habitual. Not all Medanese is rude, that is just the way of speak. This discussion invite students to think one issue from different perspective.

After students are aware of thinking critically, teacher may gradually pick the weightier and controversial text in which students compare and contrast two articles on the same subject. The objective is to critically examine each article in the context of the other to determine how the author craft the text to suit those purposes, as well as the consequences and power relations he/she wants to deliver in the text. Teacher can show one text in online news presented in different perspective. For example the controversial issue of Dudung Abdurachman's as an Army Chief of Staff with his statement: *Ketika saya berdoa, saya menggunakan Bahasa Indonesia, karena Tuhan kita bukan orang Arab* (When I pray, I only use Indonesian because our God is not the Arab) on Deddy Corbuzier's YouTube channel. This statement raises controversial opinions from religious figures, politicians, to common public in online news and social media. The negative comments are: it is not appropriate to make an analogy between

God and people, God has not ethnic and national, he misinterprets and misunderstands of Islam, and his actions are counterproductive to his duties as an army. Because of his statements, they reported him to the Army Military Centre in January 2022 because of blasphemy accusation.

To invite students to examine the statement, teacher asks student to find the data in online news or in YouTube. This step leads to the more complex questions that will emerge the students' critical thinking awareness. Some critical questions addressed to learners are what the topic is, who probably write it, what their position would be, what institution they belong to, what the writer's purposes are, to whom it is written, why the text is written, there are economic/material interests or not, what the other ways of writing about the topic are, who behind the construction of this text is, where the text comes from (historical/cultural), or what social function it is.

By implementing critical discourse analysis, the critical thinking of students can be seen from their comment of Dudung Abdurrahman case: as a soldier, Dudung has a responsibility to maintain the unity of Indonesia. The ideology of unity is reflected in his utterance "Our God is not Arab", which does not mean equating God with humans, but rather emphasizes the message that there is nothing that makes Arabs more special than Indonesians, considers Arabs to be more worthy of respect than others, and considers people who can speak Arabic better than those who cannot speak Arabic. Related to ethnicity, race, and religion, no particular ethnicity, race, or religion is better than another. All those are the same. Another student says: The ideology of unity is the main key to Dudung's speech which cannot be separated from the institutional context of the Army as his institutional context. This stage aims to make students

to be critical thinker by exploring many sources before judging someone.

The last stage is the end of the class, where the students get to evaluate on how much knowledge they got from the learning process. In this stage, teachers may give students re-examine the text from their perspective or they are being meaning maker. They summarize their opinions on the issues raised in the article. Through social action projects like helping other students, writing to magazines or journals, taking part in discussion activities, and rechecking the news before sharing to others, students will develop social awareness in this final stage of critical literacy exploration. This will help them to have a better understanding of others, a greater appreciation of diversity, and an awareness of how to live in a globalized world.

Discussion

Integrating technology and acquiring critical thinking skills are important to generate critical thinker as well as to improve teacher performance. Teachers as catalysts of change must take the initiative to provide technology-based materials for successful teaching. The infusing of digital technology in critical literacy instruction in this study with the new method of teaching from before learning, during teaching, and end of the class in this study aligns with Iyer (2010), Nguyen et al. (2022), Minott (2011), and Park (2011) researches. Teachers are critically important in implementing technology to enable students to learn anything, anytime, and anywhere. The use of technology in this research by utilizing Internet is seen as the key to enabling students to acquire information spontaneously in this information age, which provides access to more information and requires more knowledge (Ayu, 2020). The active use of technology in critical literacy pedagogy increases the competitiveness of teachers and students in

the field around the world (Boholano et al., 2021).

The technology attributes are the foundation to facilitate technology-based learning. The use of website, digital platform, such as YouTube, or social networking: Facebook, Twitter, Instagram, WhatsApp, or Tiktok are the technology literature that have potential value to support teaching. The use of those digital technologies in this research is supported by Bouhnik and Deshen (2014) who stated that that WhatsApp is one of the social networking apps that is suitable and well-liked by students as a mobile learning medium. One of the newest potential social networking apps, WhatsApp is made to run on both computers and mobile devices and is compatible with all current operating systems and device. Justina (2016) used WhatsApp to improve students' reading and writing abilities in the undergraduate college program. Sabir et al. (2021) promoted another method of technology use by honing writing skills through email and conversation. Learners can hone their writing skills by sending and receiving emails. Most universities and a few schools give their students the assignment to send emails to their classmates in order to get them used to writing. Students utilize websites such as Hotmail, Yahoo, and Gmail.

In teaching critical literacy, educator teaches flexibility that allows students to use their smartphone to find the sources. That strategy is effective as Mengorio & Dumlaos' study (2019) who demonstrated that using mobile applications to teach languages improves student learning outcomes. Participants of their study also claim that because using a mobile application as a tool is simple and beneficial, learning is more enjoyable for them.

Utilizing technology in teaching reading comprehension as the main material in critical literacy instruction is more effective, in accordance with Konishi (2003) who stated that authentic materials

are readily available online. Leu and Coiro (2004) observed that, "the Internet has entered our classrooms faster than books, television, computers, the telephone, or any other technology for information and communication". Ismawati (2022) found that using a web platform to teach students makes them read texts more effectively, and helps students understand texts better. Meanwhile students' writing abilities were greatly improved by the use of media and the application of instructions that is possible to explicitly teach students how to interpret media content, evaluate its social implications, and investigate the function, target audience, and ownership of the media (Choo & Singh, 2011; Mbau & Sugeng, 2019).

Teacher also uses blended learning in teaching method because it has some benefits. It encourages interaction between students both physically in the classroom and virtually outside of the classroom. Because blended learning involves the usage of technology, it will help students interact easily with all communities, both inside and outside the classroom. This has reformed the teaching activities from teacher-centred to student-centred. Outside of the lesson hours, teachers have plenty of time to provide feedback on student development and to motivate students and answer unresolved questions in the classroom (Zainuddin, 2017; Zainuddin et al. 2018).

Teacher asks critical questions to students during the learning so both students and teachers have more space to engage in critical reflection on certain topics. Critical thinking is the key features of learning activities for critical literacy. It happens because the moral concept of critical literacy can be effectively conveyed, and dialogical activities that include critique can be a means of achieving understanding (Endres, 2001, as cited in Mbau & Sugeng, 2019). Promoting critical question also aligns with Huang (2011), Abednia and Izadinia (2013), and Park (2011) who highlighted

that the key component in critical literacy teaching is critical question. Discussion around the definition of critical literacy-oriented will not leave behind the questioning. This key component has been part of nearly any studies on critical literacy implementation.

In EFL, utilizing technology actually offers a number of advantages. Social networking websites have been acknowledged as effective tools for enhancing all language abilities (Nugroho & Rahmawati, 2020). Technology as a learning media has shown to be effective for increasing students' abilities and skills in English. Sabar et al. (2011) conducted research on how the usage of Web (E-learning) in the learning process affects the students. Students' skills in English shows an improvement in terms of reading, writing, vocabulary, and grammar. This happens because they are actively involved in the learning process, where they have to do research about the material. Not only that, they also have to use the information they got in order to understand more about the material. According to studies by Chun and Plass (1996), Laufer and Hill (2000), Sullivan and Pratt (1996), as well as Warschauer and Healy (1998) there are a number of advantages for students who utilize technology in general to learn foreign languages. They include greater student-centred learning and involvement in the learning process, as well as increasing motivation, self-concept, and mastery of fundamental skills (Stepp-Greanny, 2002). Studies by Dywer (1994) and Weiss (1994) showed that learners frequently demonstrate enhanced cognitive skills, recall, and active language processing as the use of technology for language teaching and learning continues to grow.

Conclusion

All over the world, technology use has recently increased. Educational institutions have been experimenting with digital technology in teaching and learning

since the 20th century to determine how well it supports the traditional teaching approach. The new teaching paradigm is encouraged to meet the demands of the 21st century. It combines a traditional core skill with learning and innovation skills, career and life skills, and digital literacy skills. As a way of reading the world and the written word, critical literacy is used to encourage students to exercise critical thinking, problem-solving, and action in their daily lives. Because both critical thinking and digital technology are essential for the workforce, it is crucial for developing critical thinking awareness to integrate digital technology into critical literacy. Critical literacy using technology with teacher as a key player in this process generate students to be better to choose, gather, analyse, and evaluate the abundance of information available online with the aid of learning activities that foster critical thinking.

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