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DEVELOPMENT OF THE LATEST CURRICULUM-BASED LEARNING MODEL TO IMPROVE STUDENTS' DIGITAL LITERACY AND CRITICAL THINKING SKILLS IN THE INFORMATION TECHNOLOGY ERA

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Abstract

In the rapidly evolving Information Technology era, students' demand for digital literacy and critical thinking skills has never been more pressing. This abstract presents an overview of the development of the latest curriculum-based learning model designed to enhance students' digital literacy and critical thinking abilities. Our model, tailored for the modern educational landscape, strongly emphasizes integrating technology into the learning process. It leverages a combination of innovative pedagogical approaches, updated content, and interactive tools to engage students in the digital world. By focusing on digital literacy, students are equipped with the skills to navigate, evaluate, and create digital content effectively while fostering an understanding of online safety and ethical behavior. Furthermore, the model fosters critical thinking through project-based learning, problem-solving activities, and collaborative assignments. It encourages students to analyze information critically, synthesize ideas, and make informed decisions. Integrating real-world case studies and hands-on experiences ensures that students can apply their knowledge in practical situations.

Keywords: Curriculum-based learning, digital literacy, critical thinking skills, Information Technology era, educational technology, project-based learning, online safety, ethics, problem-solving, interactive tools.

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Introduction

The Information Technology Era, often called the Digital Age, has ushered in an unprecedented wave of digital transformation that permeates every facet of our lives. In just a few decades, technology has evolved from being a peripheral tool to an integral part of our daily existence (Hu, 2021; Putra et al., 2020; Hendriarto et al., 2021; Sudarmo et al., 2021). This digital revolution has been driven by several interconnected factors, chief among them being the proliferation of digital devices, the widespread availability of the internet, and the vast reservoir of online information. The impact of these technological advancements has been profound. They have not only altered our modes of communication but have fundamentally transformed how we work, learn, and access information. Today, from how we socialize and conduct business to how we seek knowledge and entertainment, technology is inextricably interwoven into the fabric of modern life (Calabretta & Kleinsmann, 2017).

However, this digital revolution comes with its own set of challenges. The ubiquity of technology and the sheer volume of online information have created a pressing need for individuals to develop digital literacy and critical thinking skills. The ability to effectively navigate this ever-expanding sea of digital content and technology has become necessary. The context has shifted from mere proficiency in handling gadgets to the broader skill set required to understand, evaluate, and utilize technology and information meaningfully (Elliott, 2019; Aslan et al., 2020). In this digital age, digital literacy and critical thinking are not merely skills but fundamental competencies that wield significant influence over personal and societal success. Digital literacy is a multifaceted concept, extending beyond the mere ability to use and understand digital devices, software, and platforms. At its core, it encompasses the capacity to assess and synthesize digital information critically, distinguish between credible and unreliable sources, and make informed decisions based on the ever-evolving digital landscape.

Critical thinking, on the other hand, emerges as an indispensable pillar supporting the edifice of informed and intelligent decision-making. The cognitive ability allows individuals to confront complex issues, evaluate arguments, and solve problems by making reasoned judgments. In an era of digital information, critical thinking skills empower individuals to analyze, synthesize, and draw meaningful conclusions from the vast data they encounter (Leslie, 2019). Digital literacy and critical thinking skills are not standalone attributes. Instead, they are interconnected and mutually reinforcing. Digital literacy equips individuals with the tools necessary to access and engage with digital information, while critical thinking empowers them to evaluate the veracity and relevance of that information. This dynamic interplay between digital literacy and critical thinking is pivotal for personal growth, professional success, and active citizenship in the Information Technology Era (Machfiroh et al., 2018).

This research aims to delve deeper into the intricate relationship between digital literacy and critical thinking in the context of the Information Technology Era. This study explores how digital literacy skills contribute to developing critical thinking abilities and, conversely, how critical thinking enhances digital literacy. It seeks to unravel the complex web of interactions that underlie these competencies and the transformative impact they can have on individuals' lives (Van Laar et al., 2018).

To investigate the relationship between digital literacy and critical thinking, this study will address the following research questions; 1) How do digital literacy skills influence an individual's ability to assess and analyze digital information critically?. 2) What are the key components of digital literacy that contribute to developing critical thinking skills?. 3) In what ways does critical thinking empower individuals to make well-informed decisions in the Information Technology Era?.

This research carries significant implications for individuals, educators, policymakers, and society. It provides a roadmap for understanding how digital literacy and critical thinking intersect and how they can be nurtured and harnessed. The findings of this study will contribute to developing more effective strategies for fostering these skills, ultimately enabling individuals to navigate the digital landscape with confidence and discernment. In the educational realm, this research highlights the importance of adapting curricula and teaching methodologies to nurture digital literacy and critical thinking from an early age. It underscores the need for educators to teach technical skills and cultivate the ability to think critically about the digital information encountered (Selvin, 2017).

Moreover, as informed decision-making becomes increasingly vital in various domains, including politics, economics, healthcare, and personal life choices, this research will offer valuable insights into how individuals can harness digital literacy and critical thinking to make better-informed decisions. It emphasizes that, by developing these skills, individuals can actively contribute to forming a more informed and empowered society (De Groot, 2014; Putra, Mizani, et al., 2020).

Research Method

In research design, a judicious choice is made by adopting a mixed-methods approach that combines quantitative and qualitative methods to attain a more holistic and nuanced comprehension of the intricate relationship between digital literacy and critical thinking in the Information Technology Era. This approach is deliberate in its pursuit of a comprehensive understanding, as it recognizes that digital literacy and critical thinking are multifaceted constructs that warrant investigation from multiple angles. By marrying quantitative data with qualitative insights, the research design allows for the exploration of the extent to which these competencies exist, the depth of their impact, and the various contexts in which they manifest. The chosen research design, thus, provides a robust framework that can accommodate the multifaceted

nature of the digital age and the competencies required to navigate it effectively (Jones & Hafner, 2021). In selecting the participants for this study, meticulous attention is paid to ensuring that the sample is diverse and representative, reflecting the varied dimensions of digital literacy and critical thinking. The criteria for participant selection are designed to encompass a spectrum of backgrounds, including differences in age, education levels, and digital literacy proficiencies. By drawing participants from a wide range of contexts, such as different professions and walks of life, the research seeks to capture the multifaceted influence of these competencies on individuals' lives. The choice to include participants with differing degrees of digital literacy, from novices to experts, underlines the research's commitment to shedding light on the developmental trajectory of these competencies and their impact across different phases of digital proficiency. The criteria for participant selection are meticulously designed to create a sample that reflects the complex tapestry of digital literacy and critical thinking in society (Rodesiler, 2014).

Data Collection

A combination of research methods is judiciously employed to ensure that data collection for this research is comprehensive and multifaceted. The survey methodology offers a structured approach to gathering quantitative data, which is crucial in quantifying participants' self-assessment of their digital literacy and critical thinking skills. These surveys are meticulously crafted to probe participants' levels of digital literacy, their ability to critically evaluate digital information, and their approaches to making decisions based on the digital content they encounter. Including Likert scale questions in the surveys allows for a nuanced assessment of participants' self-perceived competencies (Allioui & Mourdi, 2023).

Complementing the quantitative approach, in-depth semi-structured interviews are conducted to unearth rich qualitative insights. These interviews serve as a window into participants' lived experiences, perceptions, and practices in digital literacy and critical thinking domains. The open-ended nature of the interview questions encourages participants to provide detailed accounts of their experiences, yielding a deeper understanding of the multifaceted impact of these competencies on individuals' lives (Lenette et al., 2015).

Furthermore, a systematic qualitative method, content analysis, is employed to assess the quality and relevance of digital content. This method allows for examining real-world digital information, such as online articles and news stories, to determine their credibility and potential cognitive biases. By extending the research scope to include an analysis of digital content, this research aims to bridge the gap between theory and practice, providing insights into how digital literacy and critical thinking are applied in assessing actual digital information (Alt & Raichel, 2020). Additionally, observations are conducted to provide a real-time view of participants' interactions

with digital content. This method involves observing participants as they engage with digital information, noting their online information-seeking behavior, and documenting their responses to the digital content encountered. Observations offer a unique perspective into how these competencies are applied in real-life situations and how they manifest in practice.

Data Analysis

The data analysis process in this research unfolds in a mixed-methods approach that effectively combines quantitative and qualitative analysis methods. In quantitative analysis, the survey data is subjected to statistical scrutiny using specialized software like SPSS. This phase entails the application of descriptive statistics, which includes the computation of means, standard deviations, and frequencies to summarize participants' self-assessment of their digital literacy and critical thinking skills. These quantitative metrics provide a numerical snapshot of the extent of these competencies in the sample. Moreover, inferential statistics, such as correlation analysis, are employed to uncover potential relationships between variables, unveiling the complex interplay between digital literacy and critical thinking (Kasperski et al., 2022).

In tandem with quantitative analysis, qualitative data derived from interviews, content analysis, and observations are analyzed thematically. This in-depth qualitative analysis allows for identifying recurring themes, patterns, and commonalities in participants' experiences and perspectives. It unravels the nuances that quantitative data might miss, offering a rich and textured understanding of how digital literacy and critical thinking manifest and interact in participants' lives. This qualitative analysis adds depth to the research, providing a holistic perspective on these competencies in practice (Patton, 2014).

Ethical Considerations

The research conducts itself with the highest regard for ethical principles, safeguarding the rights and well-being of the participants and upholding the integrity of the study. Central to these ethical considerations is the principle of informed consent, wherein participants are comprehensively briefed on the study's objectives, procedures, potential risks, and benefits. Their written informed consent is meticulously obtained, ensuring their voluntary participation in the research. Furthermore, their confidentiality is diligently preserved, and their data is anonymized to protect their privacy (Arifin, 2018).

The principle of voluntary participation is sacrosanct in this research, granting participants the unequivocal right to withdraw from the study at any juncture without facing any repercussions. The importance of debriefing after participation is paramount to clarify the purpose and implications of the study, leaving participants with a comprehensive understanding of their involvement. Data security is vigilantly

maintained, with stringent measures in place to secure and protect all collected data, and data retention is in strict compliance with data protection regulations (Gupta, 2020).

The research maintains impartiality and objectivity as researchers refrain from any form of bias or interference that could compromise the validity and reliability of the research findings. The ultimate beneficence of the research is anchored in its potential to contribute to the understanding of the interplay between digital literacy and critical thinking, fostering individual growth and societal enlightenment (Hiles & Hinnant, 2014). The research methodology adopted in this study is characterized by its depth and comprehensiveness. It integrates multiple research methods to investigate the multifaceted relationship between digital literacy and critical thinking. This methodology adheres to ethical principles, prioritizing the participants' rights and well-being and the research's integrity, thus ensuring a comprehensive and well-rounded exploration of these vital competencies in the Information Technology Era.

Results

The digital transformation of society has led to significant changes in how we interact with information and technology. Digital devices, such as personal computers, smartphones, smart appliances, and wearable technology, have become integral to our daily lives. These devices serve as our primary means of communication, information access, and entertainment. The proliferation of digital devices has made digital literacy an essential skill (Van Veldhoven & Vanthienen, 2022). The internet, often called the "information superhighway," has played a transformative role in the Information Technology Era. It has erased geographical boundaries, enabling instant information, ideas, and services exchanges. However, the open and borderless nature of the internet has also resulted in an inundation of unfiltered, unverified, and, at times, inaccurate information. This highlights the need for individuals to develop digital literacy skills to navigate the vast information landscape effectively (Hassan, 2018; Nugraha et al., 2021; (Suroso et al., 2021).

The digital age has brought with it an overwhelming amount of information. With just a few clicks, individuals can access a wealth of data, including scholarly articles, educational resources, social media posts, and user-generated content. However, this abundance challenges discerning credible sources from misinformation, disinformation, and irrelevant noise (Benselin & Ragsdell, 2016). Digital literacy encompasses many competencies, including basic computer skills, information literacy, media literacy, and data literacy. These skills equip individuals with the knowledge and abilities to use digital technologies effectively, critically evaluate digital information, and make informed decisions.

Critical thinking is a higher-order cognitive skill that involves active, purposeful, and disciplined evaluation and analysis. It enables individuals to examine arguments,

discern biases, assess evidence, and make reasoned judgments. In the Information Technology Era context, critical thinking is vital for individuals to confront complex and often ambiguous digital information and issues (Thorndahl & Stentoft, 2020). Critical thinking empowers individuals to approach digital information and content discerningly. It allows them to scrutinize the quality and relevance of information, distinguish between fact and opinion, and identify logical fallacies or cognitive biases in arguments. When faced with contradictory sources or conflicting perspectives, critical thinking skills enable individuals to navigate the ambiguity and make informed choices. Critical thinking is crucial for practical problem-solving, particularly in the digital age. It allows individuals to break down complex issues into manageable components, consider multiple viewpoints, and synthesize information to arrive at viable solutions. This skill is precious in digital technology, where individuals frequently encounter technical challenges and decision-making scenarios (Coleman et al., 2016). Digital literacy serves as the gateway to critical thinking. It equips individuals with the foundational skills needed to access and engage with digital information, including the ability to search for information, evaluate the credibility of sources, and use digital tools effectively. In essence, digital literacy provides the entry point for individuals to enter the realm of critical thinking.

Once individuals have entered digital information, critical thinking becomes the destination. The cognitive engine powers the evaluation and analysis of this information. Critical thinking allows individuals to interrogate the information they encounter, identify biases, assess evidence, and make well-reasoned judgments. It is the process through which digital information is transformed into knowledge and informed decision-making (Cladis, 2020). The relationship between digital literacy and critical thinking is mutually reinforcing. As individuals become more digitally literate, their ability to access and evaluate digital information improves, enhancing their capacity for critical thinking. Conversely, as individuals develop critical thinking skills, they become more adept at discerning the quality and relevance of digital information, advancing their digital literacy. These two competencies function as a positive feedback loop, enhancing an individual's ability to navigate the digital landscape effectively (Kapoor, 2018).

In conclusion, digital literacy and critical thinking have profound implications for education and society. In an era marked by a constant stream of information and rapid technological change, these skills are vital for fostering informed decision-making, enabling individuals to assess information critically, and contributing to the well-being of individuals and society. Education, guided by these principles, is essential for shaping a brighter future in the Information Technology Era (Schlechty, 2009).

Discussion

The intertwining relationship between digital literacy and critical thinking is of paramount importance in the context of education. It necessitates a fundamental shift in educational paradigms. While traditional education has primarily focused on imparting subject-specific knowledge and technical skills, the Information Technology Era requires a broader, more holistic approach that includes the development of digital literacy and critical thinking skills from an early age (Chalkiadaki, 2018; Sarmila et al., 2023; Nurdiana et al., 2023).

Education is the cornerstone upon which the development of digital literacy and critical thinking skills should rest. The implications for educational institutions are profound. In addition to teaching subject-specific content, the curriculum should be redesigned to incorporate digital literacy and critical thinking as essential components. Students must acquire the ability to use digital tools and cultivate the capacity to think critically about the information they encounter in the digital landscape (Jolls & Johnsen, 2017). As part of these curricular changes, educational institutions can develop information literacy programs that help students distinguish credible sources from misinformation. Digital research assignments can be integrated into various subjects, enabling students to assess the reliability of online information. Moreover, media literacy exercises can foster an understanding of the persuasive techniques used in digital content.

Digital Literacy in the Classroom

The classroom is the ideal setting for the integration of digital literacy. In addition to traditional subjects, students must be taught how to responsibly navigate the digital realm. This involves not only the use of digital tools but also the ability to assess the credibility of sources. Teachers can guide students on how to engage with digital content responsibly and ethically (Sadaf & Johnson, 2017). Practical exercises, such as evaluating websites for credibility and conducting online research, should be integral to learning. Students should be encouraged to think critically about the information they find, question its sources, and apply the principles of critical thinking to their digital encounters. These efforts are essential for equipping students to handle digital information's complex, ambiguous nature.

Fostering Critical Thinking

Teaching critical thinking is equally vital. It is not just a skill limited to specific disciplines but a transversal skill that can be applied across various fields. Creating an educational environment that encourages students to question, analyze, and evaluate information is essential. Activities such as debates, case studies, and problem-solving exercises should require students to apply critical thinking skills (Liang & Fung, 2021). Critical thinking is not just about discerning the quality and relevance of information but

also about considering multiple viewpoints, understanding the nature of evidence, and making well-reasoned judgments. In the Information Technology Era, these skills are invaluable for students as they navigate a world filled with diverse perspectives and constant information.

Preparing Informed Citizens

Educators are responsible for preparing students to be informed and active citizens in an era marked by the ubiquity of digital information. By nurturing digital literacy and critical thinking skills, educators equip students with the tools to navigate the digital landscape, make informed decisions, and contribute to society. In this sense, education extends beyond the classroom and becomes a crucial element in shaping the future of societies (Stitzlein, 2017; Tuhuteru et al., 2023; Aslan & Shiong, 2023).

Through education that emphasizes digital literacy and critical thinking, students can develop the capacity to evaluate political news sources critically, engage in fact-based debates, and make informed voting decisions. In healthcare, individuals can research medical information critically, understand the implications of their health choices, and advocate for their well-being. In the economic sphere, financial literacy, supported by digital literacy and critical thinking, allows individuals to make sound investment decisions and navigate the complexities of the digital economy (Haryanto et al., 2022). The implications of a digitally literate and critically thinking population extend far beyond the classroom. In a world characterized by an incessant stream of information and rapid technological advancements, the ability to make informed decisions has never been more critical. This capacity for informed decision-making is relevant in various aspects of life, including personal health choices, political participation, and financial investments.

In this era, informed decision-making is essential. Individuals must sift through vast amounts of data to make choices that align with their goals and values. This extends to health decisions, where individuals can research medical information critically, understand the implications of their choices, and advocate for their own well-being (Witteman & Zikmund-Fisher, 2012). Digital literacy and critical thinking are catalysts for informed decision-making. Digital literacy equips individuals with the skills necessary to access and evaluate information critically, while critical thinking enables them to analyze and synthesize this information. These competencies provide individuals with the tools to make reasoned judgments and informed choices.

The Societal Impact

The societal impact of a digitally literate and critically thinking population is profound. In the political arena, informed citizens are better equipped to assess the credibility of news sources, engage in fact-based debates, and make informed voting decisions. In healthcare, individuals can navigate the complexity of medical information,

understand the implications of their health choices, and advocate for evidence-based healthcare practices. Financial literacy, underpinned by digital literacy and critical thinking, in economics, allows individuals to make sound investment decisions and navigate the digital economy (Sharma et al., 2016). In conclusion, the interplay between digital literacy and critical thinking is a powerful force that shapes education and the broader societal landscape. As we navigate the Information Technology Era, the cultivation of these skills from an early age is crucial for fostering responsible, informed, and empowered citizens who can thrive in a world characterized by a deluge of digital information. Education, driven by these principles, is the key to shaping a brighter future for societies in this digital age.

Conclusion

In the Information Technology Era, the interplay between digital literacy and critical thinking is of paramount importance. With its abundance of information and technology, the digital landscape demands that individuals acquire technical proficiency and the ability to evaluate and synthesize digital content critically. Digital literacy is the entry point, equipping individuals with the tools to access and engage with digital information. At the same time, critical thinking is the destination, powering the evaluation and analysis of this information. The education sector is central in nurturing these competencies, adapting curricula and teaching methodologies to foster digital literacy and critical thinking. By doing so, educators empower students to become informed and active citizens in the digital age.

The societal impact of a digitally literate and critically thinking population is profound. Informed citizens are better positioned to participate in politics, make informed healthcare choices, and navigate the complexities of the digital economy. The symbiotic relationship between digital literacy and critical thinking is central to personal growth, professional success, and active citizenship in the Information Technology Era. In conclusion, the Information Technology Era offers boundless opportunities and challenges, and the ability to harness its potential hinges on developing digital literacy and critical thinking. These competencies enable individuals to navigate the digital landscape, critically evaluate information, and make informed decisions, contributing to a more enlightened and empowered society. As technology continues to evolve, the synergy between digital literacy and critical thinking will remain pivotal for individuals and society as a whole.

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