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Digital Literacy's Influence on Critical Thinking Skills of Office Administration Education Students at UNESA

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Abstract : This study aims to discover a significant positive relationship between digital literacy and critical thinking abilities among students in the Office Administration Education Program at Universitas Negeri Surabaya. The research employed a quantitative ex-post facto design. The sample consisted of 235 randomly selected students from a population of 650. Sample determination utilized the Isaac and Michael table with a 5% margin of error. Data collection was conducted via survey using a questionnaire. Data analysis techniques included outer model analysis (convergent validity, composite reliability, Cronbach's alpha, discriminant validity, AVE), inner model analysis (R-Square, F-Square, direct effect) using smartPLS 4.0 software. The findings indicate that digital literacy significantly influences critical thinking abilities among Office Administration Education students' class of 2021-2023. The implications of this research are that a student's digital literacy can aid in collecting, organizing, and analyzing data, as well as synthesizing information from various digital sources, allowing one to build a more comprehensive and integrated understanding of an issue and develop stronger arguments.

Keywords : Digital Literacy, Critical Thinking Abilities, Office Administration Education

INTRODUCTION

Critical thinking skills are currently essential for everyone to confront challenges and issues in life. Therefore, cultivating critical thinking habits is crucial for the younger generation, especially college students. Throughout their academic journey, students are prepared and equipped with knowledge to navigate the competitive landscape of the workforce through both on-campus and off-campus learning experiences. This is because individuals with critical thinking skills can adapt to changes and complex environments (Sudrajat et al., 2021). Someone with critical thinking skills is not just adept at arguing or debating, but is capable of thinking to find solutions to problems. Essentially, critical thinking is an effective skill that enables students to achieve success in dynamic environments by enhancing their thinking abilities (Aktoprak & Hursen, 2022). Thus, individuals with critical thinking skills can make informed decisions

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regarding problems or challenges they face, using well-directed and organized alternative solutions.

This demonstrates that critical thinking involves a thoughtful and meticulous thinking process concerning information and beliefs, while considering supporting evidence (Rahmawanty, 2017). Students accustomed to critical thinking will delve deeper into information and understand the core of issues, enabling them to generate multiple alternative solutions for making informed decisions. Critical thinking is a cognitive skill involving disciplined conceptualization, analysis, application, evaluation, reasoning, argumentation, and conclusion-making processes to guide actions or decision-making (Fitri et al., 2023). Critical thinking abilities can be cultivated through one's environment and social circles. Every lecturer undoubtedly expects their students to possess critical thinking skills in both learning processes and completing academic tasks. However, the reality in the field is that not all students possess critical thinking skills. Students' critical thinking skills can be developed by continuously updating their information and knowledge. Today, with the sophistication of information technology, it is very easy to access various desired information, demanding that students be tech-savvy.

Digital literacy provides a strong foundation for enhancing one's critical thinking skills by facilitating access to diverse information, utilizing advanced analytical tools, and enabling critical and skeptical evaluation of information. Digital literacy itself is the ability for individuals to adapt to technological advancements, encompassing skills such as searching for information on the internet, reading and understanding websites, evaluating various media, and drawing conclusions from information obtained from social media (Putra et al., 2023). Previous research conducted (Rochmatika et al., 2020) indicates a positive influence of digital literacy on students' critical thinking abilities, where students with knowledge and skills in digital literacy exhibit critical thinking capabilities in solving economic issues while studying economics. Similarly, (Haryanto et al., 2022) found a positive and significant correlation between digital literacy and critical thinking skills. However, contrasting findings were reported in the study (Indah et al., 2022) which suggests that digital literacy does not always automatically support the enhancement of critical thinking skills.

Based on the initial observations conducted by the researcher on students of the Office Administration Education Program at Universitas Negeri Surabaya from the 2021-2023 cohort, it was found that many students exhibit less than optimal critical thinking abilities. This is evident during both offline and online classroom learning processes, where only a few students

are actively engaged. Particularly during question and answer sessions, only a handful of students respond and actively participate in discussions with both lecturers and fellow students. Moreover, during observations and when respondents were asked questions, their answers were often based on personal opinions rather than supported by reliable sources. Similarly, when faced with challenging problems in assignments, they tend to rely on classmates whom they consider capable. Such habits hinder the development of students' critical thinking skills. Given the observed phenomena among students of the Office Administration Education Program at Unesa from the 2021-2023 cohort and the discrepancies with previous research findings, the researcher aims to further investigate the influence of digital literacy on students' critical thinking abilities.

RESEARCH METHOD

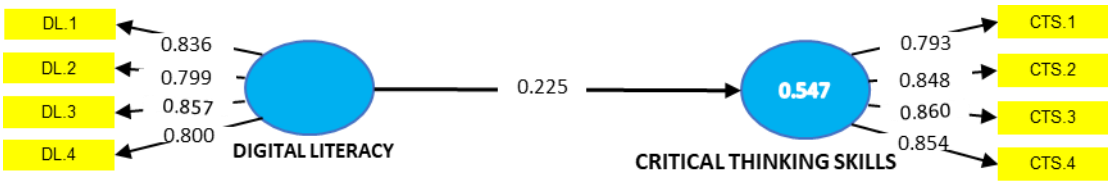
This study is a quantitative research using an ex-post facto method. The quantitative approach is chosen because each variable analysis is presented using numbers and is statistically analyzed (Sugiyono, 2016). The quantitative approach is a research method aimed at testing hypotheses based on positivist philosophy using sample and statistically analytical methods (Saragih et al., 2021). The study aims to obtain data and information that will explain the influence of digital literacy on critical thinking abilities in students of Office Administration Education. Digital literacy is the ability of an individual to operate communication tools and technology to search for, access, manage, and obtain information and knowledge that meets the demands of the times. Critical thinking, on the other hand, is the ability to analyze, reason, and evaluate information obtained from various sources and draw conclusions from that information.

The sample is taken from Isaac and Michael's table with a 5% error rate. Thus, from a population of 650 Office Administration Education students, a sample size of 235 students is obtained. The sampling technique used is Proportionate Stratified Random Sampling, which is employed when the research population has heterogeneous and proportionally stratified members/elements (Sugiyono, 2016). It is considered heterogeneous because the population in this study has varying backgrounds and abilities and is composed of three different cohorts, which can be regarded as strata. The data collection method used is a questionnaire created by the researcher, with a Likert scale as the measurement tool. The questionnaire will be developed by the researcher using Google Forms, then distributed to respondents via WhatsApp. Instrument testing is conducted through validity and reliability tests. For data analysis, the

researcher utilizes smartPLS 4.0 software, employing analysis techniques including outer model analysis (convergent validity, composite reliability, Cronbach's alpha, discriminant validity, AVE), and inner model analysis (R-Square, F-Square, direct effects).

RESULTS AND DISCUSSION

The outer model analysis is used to evaluate the constructs of variables to determine their suitability as measurement tools (validity and reliability) (Siagian & Khair, 2018). Several calculations are employed in this study, including Convergent Validity, Composite Reliability, Cronbach's Alpha, Discriminant Validity, and Average Variance Extracted (AVE) (Ghozali & Latan, 2015). The results of the outer model analysis are as follows



Picture 1. The results of the outer model analysis

Convergent Validity is the loading factor value on latent variables indicating that the indicators are statistically significant with values > 0.7 (Hair et al., 2010). The results of Outer loading values can be seen in the following table. Based on Table 1, testing the loading factor values with digital literacy variables and critical thinking abilities, all items have values > 0.7. Therefore, all items are considered valid and can be retained.

Table 1. Convergent Validity

Variabel	Code	Loading Factor Value
Digital Literacy	DL.1	0,836
	DL.2	0,799
	DL.3	0,857
	DL.4	0,800
Critical Thinking Skill	CTS.1	0,793
	CTS.2	0,848
	CTS.3	0,860
	CTS.4	0,854

Composite Reliability is a measurement indicating that a construct can be considered to have high reliability and can be relied upon if it is > 0.7 (Hair et al., 2010). The results of composite reliability can be seen in the following table. Based on Table 2, the results of composite reliability with digital literacy and critical thinking abilities variables show that all items have values > 0.7. Therefore, all items are considered to have high reliability.

Table 2. Composite Reliability

Variabel	Composite reliability
Digital Literacy	0,851
Critical Thinking Skill	0,867

Cronbach's Alpha is a calculation used to measure the results of composite reliability with a value > 0.07 (Hair et al., 2010). The results of Cronbach's alpha can be seen in the following table 3. Based on Table 3, the results of Cronbach's alpha with digital literacy and critical thinking abilities variables show that all items have values > 0.7. Thus, all items contribute to strengthening reliability.

Tabel 3. Cronbach Alpha

Variabel	Cronbach's alpha
Digital Literacy	0,842
Critical Thinking Skill	0,860

Discriminant Validity is the cross-loading factor value useful for determining the extent to which a construct is truly different and adequate from other constructs. Discriminant validity can be observed through cross-loadings between indicator values and their constructs and through Fornell-Larcker by comparing the square root of the AVE of each construct with the correlations between one construct and another. The results of discriminant validity can be seen in the following table.

Tabel 4. Cross Loading

	Digital Literacy	Critical Thinking Skill
DL.1	0,836	0,474
DL.2	0,799	0,462
DL.3	0,857	0,579
DL.4	0,800	0,623
CTS.1	0,511	0,793
CTS.2	0,519	0,848
CTS.3	0,586	0,860
CTS.4	0,576	0,854

Tabel 5. Fornell-Larcker

	Digital Literacy	Critical Thinking Skill
Digital Literacy	0,823	
Critical Thinking Skill	0,655	0,839

Based on Tables 4 and 5, the results of Cross Loading and Fornell-Larcker for digital literacy and critical thinking abilities variables show that all indicator values in Cross Loading are greater than the construct value, and in Fornell-Larcker, all AVE square values are greater

than the value between one construct and another. Thus, it can be concluded that discriminant validity has been fulfilled.

Average Variance Extracted (AVE) is the average variance value with a value > 0.5 (Hair et al., 2010). The results of AVE can be seen in the following table. Based on Table 6, the results of AVE with digital literacy and critical thinking abilities variables show that all items have values > 0.5. Therefore, all items contribute to strengthening reliability.

Tabel 6. Average Variance Extracted

Variabel	Cronbach's alpha
Digital Literacy	0,678
Critical Thinking Skill	0,704

R-Square is a measure of the proportion of endogenous variable variation that can be explained by exogenous variables. With classifications: R2 = 0.67 is considered strong, R2 = 0.33 is considered moderate, and R2 = 0.19 is considered weak. The results of R-Square can be seen in the following table:

Tabel 7. R-Square

	Digital Literacy	Critical Thinking Skill
R-Square		0,547

Based on Table 7, the R-Square results show that the critical thinking ability variable has a value of 0.547 or 54.7%, classified as moderate. This means that 54.7% of critical thinking ability is influenced by exogenous variables, and the remainder is influenced by variables outside the study.

F-Square is a measure used to assess the relative impact or goodness of fit of exogenous variables on endogenous variables. With classifications: f2 = 0.02 is considered small, f2 = 0.15 is considered moderate, and f2 = 0.35 is considered large. The results of F-Square can be seen in the following table. Based on Table 8, the results of F-Square show that the digital literacy variable affects the critical thinking ability variable by 0.042, classified as small.

Tabel 8. F-Square

	Digital Literacy	Critical Thinking Skill
Digital Literacy		
Critical Thinking Skill	0,042	

Direct effect analysis is used to test hypotheses regarding the direct influence of exogenous variables on endogenous variables with significant P-Values.

Tabel 1. Direct Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/ STDEV|)	P values
Digital Literacy > Critical Thinking Skill	0,225	0,227	0,068	3,296	0,001

Based on Table 9, it can be explained that digital literacy has a significant influence on critical thinking ability by 0.225 with a t-statistic of 3.296 > 1.96 or a p-value of 0.001 < 0.05. Thus, it can be concluded that digital literacy has a positive and significant effect on the critical thinking abilities of Office Administration Education students class of 2021-2023.

The results of data processing show that digital literacy has a positive effect on critical thinking skills (Debby et al., 2023; Rosalina et al., 2023; Haryanto et al., 2022; Rochmatika & Yana, 2020) . Digital literacy is not just about learning and education; it encompasses various aspects globally (Haryanto et al., 2022). According to (Kamil & Rezkiawaty, 2018) digital literacy is also about smart and wise utilization of digital media. Digital literacy involves the ability to operate technology to search, evaluate, utilize, create, and communicate information both cognitively and technically. It also includes the ability to analyze and synthesize information from various sources. This process enables individuals to connect different ideas, distinguish between important and unimportant information, and build a deeper understanding of specific topics. With strong digital literacy, individuals can use technology and digital tools to solve complex problems. This includes the ability to recognize and evaluate existing solutions, as well as to develop new solutions based on the information found.

Based on the data analysis results, it can be concluded that digital literacy has a positive and significant influence on critical thinking abilities. From the loading factor results, it is found that digital literacy contributes most significantly through content evaluation indicators. This suggests that students with strong skills in evaluating content during digital literacy activities are capable of enhancing their understanding of content authenticity and relevance. Meanwhile, the lowest contribution indicator, hypertext navigation, understanding the characteristics and workings of a website using hypertext, is crucial. This feature allows access to more information, thus enhancing this skill through frequent web exploration without fear of making mistakes. Other indicators of digital literacy include internet information search and knowledge organization.

Regarding critical thinking abilities, the highest contributing indicators are synthesis and conclusion-drawing skills. This means that students are proficient in identifying and

synthesizing necessary information from various sources for decision-making. These abilities are crucial as they determine the final decision-making stages used for problem-solving. Therefore, it is concluded that students with high digital literacy, especially with high contributions from indicators such as content evaluation, internet information search, knowledge organization, and hypertext navigation, will further enhance their critical thinking abilities in synthesizing evidence and drawing conclusions. The application in the academic world regarding the influence of digital literacy on critical thinking abilities in terms of analyzing skills, evaluating information, synthesizing evidence, and drawing conclusions can be observed in the entrepreneurship course. In the entrepreneurship course, students are divided into groups to create business plans to be implemented in the practical entrepreneurship course.

Before students start drafting their business proposals after the midterm exams, the instructor first explains the aspects that must be included in the business plan proposal. To determine the product and target market, students must conduct trend analysis using information technology to obtain valid information. This is done so that the business plan proposal created can be implemented in the practical entrepreneurship course in the following semester. This research supports previous studies conducted by (Rosalina et al., 2023) which stated a positive influence of digital literacy on critical thinking abilities. Digital literacy affects critical thinking abilities by 36.4%, while 63.3% is influenced by factors outside digital literacy. In this case, the digital literacy factors that can influence critical thinking abilities include the ability to identify and sift through information, the ability to use reasoning in processing information, the application of ethical principles in behavior and communication, and the ability to articulate and integrate information based on existing knowledge.

Another study by (Rochmatika & Yana, 2020) also showed a partial positive influence of digital literacy on critical thinking abilities, indicating that students who effectively apply digital literacy in daily life will enhance their learning and problem-solving abilities through the learning process. In other words, knowledge and skills in digital literacy can support critical thinking abilities, especially in solving economic material problems. Similar findings were also noted by (Haryanto et al., 2022), indicating a positive and significant correlation between digital literacy and critical thinking skills. Thus, this research aligns with previous studies, showing that higher levels of digital literacy among students can enhance their critical thinking abilities.

CONCLUSION

Digital literacy provides a strong foundation for developing critical thinking skills by facilitating access to diverse information, using more advanced analytical tools, and evaluating information critically and skeptically. Thus, students with high levels of digital literacy, especially those proficient in content evaluation, understanding and searching for information on the internet, knowledge organization, and hypertext navigation, can enhance their critical thinking abilities, particularly in synthesizing evidence and drawing conclusions. The implications of this research are that a student's digital literacy can aid in collecting, organizing, and analyzing data, as well as synthesizing information from various digital sources, allowing one to build a more comprehensive and integrated understanding of an issue and develop stronger arguments. Future researchers may explore further the relationship between critical thinking skills and other variables such as self-directed learning, learning facilities, learning environment, and others.

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