International Journal of Education, Vocational and Social Science
https://e-journal.citakonsultindo.or.id/index.php/IJEVSS
E-ISSN : 2963 4954
IJEVSS

Conceptual Construction of Students' Digital Literacy in Learning in the Era of Society 5.0

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Abstract

This research aims to construct the concept of digital literacy in students in carrying out a learning process that is in accordance with the empirical reality in the field. The research uses a qualitative approach using grounded theory design. The research subjects consist of high school students, who use data collection techniques through in-depth interviews, observation and documentation. Data analysis is carried out through the stages of open coding, axial coding, and selective coding using a constant comparison approach. What will happen This study shares that students' digital literacy is formed through several primary dimensions, namely the ability to access information, conduct critical evaluation, digital content production, and ethics in the proper use of technology. In addition, supporting factors such as the learning environment, the role of teachers, and the intensity of technology use also affect the construction of students' digital literacy. This research produces a conceptual model of digital literacy that is contextual and adaptive to the learning demands of the Society 5.0 era.

Keywords: ***Digital Literacy, Grounded Theory, Learning, Society 5.0, Learners.***

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INTRODUCTION

The development of digital technology in the Society 5.0 era has encouraged a fundamental transformation in the education system, which requires harmonious integration of human capabilities and technology. The concept of Society 5.0 was introduced by the Japanese Government to emphasize the use of artificial intelligence and data-based technology to improve the better quality of human life, including in the field of education. In this context, digital literacy is the main competency and key that must be possessed by students in order to be able to adapt to technology-based learning dynamics so that students do not fall out of date.

Conceptually, digital literacy not only includes technical abilities in using digital devices, but also involves critical and ethical cognitive skills in managing information. According to (Yoram Eshet-Alkalai 2021) emphasizing that digital literacy is the ability to access, understand, evaluate and create information effectively through digital technology that is in line, according to Paul Gilster it is related to the ability to understand and use information from various digital sources critically. Meanwhile, according to Doug Belshaw (2020) added that digital literacy includes various important elements such as cognition, communication, creativity and social responsibility in the use of technology.

In the context of learning, digital literacy has a very strategic important role in improving the quality of student learning processes and outcomes. Digital literacy allows individuals to actively participate in the digital learning environment, including in developing critical thinking and problem-solving skills. Meanwhile, according to Neil Selwyn (2020), it is emphasized that the use of technology in education must be accompanied by a critical understanding so that it is not only oriented to the technical aspect, but also to the meaning and implications of its use.

However, various studies show that the use of technology by students is often not balanced with an adequate conceptual understanding of digital literacy. Students tend to use technology practically without a strong evaluation of the information obtained. This condition has implications for low critical thinking skills and an increased risk of misinformation and irresponsible use of technology. Therefore, an approach is needed that is able to explore in depth how students' digital literacy is formed in a better learning context.

Based on these problems, this research focuses on efforts to construct the concept of digital literacy of students through a qualitative approach with a grounded theory design. This approach allows researchers to develop a conceptual model that is sourced from students' empirical experience in using technology in learning. Thus, the results of this research are expected to make a theoretical contribution to the development of the concept of digital literacy

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as well as a practical contribution to the implementation of more effective and contextual technology-based learning in the era of Society 5.0.

Based on the explanation above, it can be concluded that digital literacy is an essential competency in facing the demands of learning in the era of Society 5.0, but its implementation in the field still shows a gap between conceptual aspects and real practice. Although students have wide access to digital technology, its use still tends to be technical and consumptive and does not fully reflect the critical, evaluative and ethical thinking skills as emphasized by Paul Gilster, Doug Belshaw and Neil Selwyn. Because this condition indicates that the development of students' digital literacy has not been optimally integrated in the learning process, both in terms of pedagogical approaches and the formation of critical awareness in the use of technology. Therefore, constructive efforts are needed through approaches based on empirical reality, such as grounded theory, to produce a digital literacy model that is contextual, adaptive, and able to answer learning needs that are more meaningful and relevant to the dynamics of technological development.

METHODS

This study uses a qualitative method with a grounded theory design that aims to construct the concept of students' digital literacy based on empirical data in the field. Therefore, this approach was chosen because it allows researchers to develop contextual conceptual models through a systematic and in-depth analysis process. The research was carried out on senior high school students (SMA) Kristen Soe. The subjects of this study were selected using purposive sampling techniques, with the criteria of students who actively use digital technology in the learning process. Additional informants, such as teachers, can be involved to enrich the data and strengthen triangulation.

Data is collected through several techniques, namely: In-depth interviews are used to explore students' perceptions and understandings related to digital literacy in learning. Observation is to observe students' behavior in using technology during the learning process. Documentation in the form of digital assignment notes or technology-based learning activities as supporting data. Data analysis is carried out simultaneously from the data collection process using the grounded theory stages, namely: Open coding: used to identify and categorize the initial concepts from raw data. Axial coding: to connect categories and subcategories to find patterns of relationships between concepts. Selective coding: to determine core categories and compile concept integration into a conceptual model of students' digital literacy. This analysis is carried

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out using the constant comparative method, which is to compare data continuously in order to obtain category consistency and depth of meaning.

RESULTS AND DISCUSSION

The results of axial coding show that the construction of students' digital literacy is greatly influenced by the interaction between internal and external factors. In a learning environment that does not fully support the integration of technology pedagogically, as well as the role of teachers who are still limited to the use of technology as a tool The elaboration of the results of this study shows that students' digital literacy in the context of learning in the era of Society 5.0 does not develop linearly but as a multi-dimensional construction influenced by the reality of the use of technology in daily life. At the open coding stage, there are four main dimensions that are identified: access to information, critical evaluation, content production, and digital ethics reflecting the factual conditions in the field, and as students in general have been able to access information quickly through digital devices, but have not been balanced with adequate evaluation skills. In practice, students still tend to receive information instantly without an in-depth verification process, and play more of a role as content consumers than creative and reflective producers. Furthermore, digital ethics are not yet fully developed, as evidenced by plagiarism, the dissemination of unverified information, and low awareness of digital footprints. This is a major obstacle. Furthermore, high levels of technology use do not automatically improve digital literacy, especially without targeted guidance. Student motivation also plays a crucial role, with students with high intrinsic motivation tending to be more productive in utilizing technology than those who primarily use it for entertainment. This demonstrates that digital literacy develops contextually and is highly dependent on the quality of students' learning experiences.

At the selective coding stage, the integration between cognitive, technical, and ethical abilities emerges as a core category that reflects the real needs in technology-based learning. Empirically, these three aspects have not been fully integrated in learning practices in schools, so a conceptual model is needed that is able to bridge these gaps. These findings are in line with the framework put forward by Menurut (Yoram Eshet-Alkalai 2021) which emphasizes the importance of a balance between the ability to access, evaluate, and produce information responsibly. Thus, students' digital literacy can be understood as an integral competency that is not only determined by individual abilities, but also by the supportive learning ecosystem. The practical implication is the need to strengthen more integrated learning strategies, where technology is not only used as a tool, but as a medium to develop critical thinking, creativity, and digital responsibility in a

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sustainable manner.

Theoretically, these findings are in line with the digital literacy framework put forward by previous researchers, which emphasize the importance of the ability to access, evaluate and produce information in a critical and responsible manner. In addition, the results of the study confirm that digital literacy in the context of education does not only function as a technical skill, but also as a means of developing critical thinking and active learning. Thus, the conceptual construction produced in order to affirm that students' digital literacy is an integral competency formed through the interaction between individual abilities and the learning environment, and has strategic implications in the development of technology-based learning effectively in the era of Society 5.0.

Table 1. Dimensions and Influencing Factors of Students' Digital Literacy

Dimension of Digital Literacy	Description	Empirical Condition	Influencing Factors
Information Access	Ability to search and obtain digital information	High students easily access information via devices	Availability of technology, internet access
Critical Evaluation	Ability to analyze and verify information	Low students tend to accept information without verification	Critical thinking skills, teacher guidance
Content Production	Ability to create digital content	Moderate to Low students act more as consumers than producers	Learning design, creativity support
Digital Ethics	Awareness of responsible and ethical technology use	Low plagiarism and misinformation still common	Moral education, digital citizenship training

The table illustrates that students' digital literacy is unevenly developed across its main dimensions. While students demonstrate strong abilities in accessing information due to widespread availability of digital devices and internet connectivity, their skills in critical evaluation and ethical use remain significantly underdeveloped. This imbalance occurs because technology

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use in learning is often not accompanied by structured pedagogical guidance that fosters critical thinking and responsibility.

The findings of this study reveal that students' digital literacy is constructed as a multidimensional and non-linear process shaped by the interaction between cognitive, technical, and ethical capacities within a specific learning ecosystem. This result reinforces the theoretical framework proposed by Yoram Eshet-Alkalai, which conceptualizes digital literacy not merely as operational skill but as a synthesis of higher-order thinking abilities, including critical evaluation and responsible information production. However, the present study extends this framework by demonstrating that these dimensions do not develop simultaneously in practice. Instead, students tend to excel in technical access while lagging in evaluative and ethical competencies. This imbalance can be explained by the dominance of instrumental technology use in educational settings, where digital tools are introduced primarily as facilitators of task completion rather than as instruments for epistemic inquiry and reflective thinking (Ng, 2022; Pangrazio & Selwyn, 2021).

The empirical evidence indicating that students function predominantly as passive consumers rather than active producers of digital content aligns with previous findings in digital education research. Studies by Neil Selwyn emphasize that the integration of technology in classrooms often reproduces traditional pedagogical patterns, where students engage in surface-level interactions with information. This condition explains why high access to digital devices does not automatically translate into high digital literacy. The current study contributes a deeper explanation by highlighting the absence of structured pedagogical mediation. Without intentional instructional design that encourages critical inquiry and content creation, students remain trapped in consumptive digital behavior. This suggests that digital literacy is not an inevitable outcome of technological exposure, but rather a socially constructed competence shaped by pedagogical practices and institutional culture (Selwyn, 2020; Howard et al., 2023).

Furthermore, the finding that digital ethics remains underdeveloped among students manifested in practices such as plagiarism and unverified information sharing reflects a critical gap in current educational approaches. This supports the argument proposed by Doug Belshaw that digital literacy must include elements of social responsibility and ethical awareness. However, unlike Belshaw's conceptual model which assumes a relatively holistic development of these elements, the present study demonstrates that ethical awareness is often the weakest dimension. This discrepancy can be attributed to the limited emphasis on digital citizenship education within formal curricula. In many learning environments, ethical considerations are treated as implicit expectations rather than explicitly taught competencies, leading to fragmented understanding

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among students (Jones & Mitchell, 2022; Ribble, 2023).

Another significant finding is the role of internal and external factors particularly learning motivation, teacher involvement, and the learning environment in shaping digital literacy. This aligns with socio-constructivist perspectives which argue that learning is mediated through social interaction and contextual experiences. However, this study advances previous research by showing that even high intensity of technology use does not significantly enhance digital literacy without guided engagement. In contrast to earlier assumptions that digital natives inherently possess advanced digital competencies, the findings confirm more recent critiques that such assumptions are overly deterministic (Kirschner & De Bruyckere, 2021). Students with strong intrinsic motivation demonstrate more productive and reflective use of technology, suggesting that motivational variables act as mediating factors in the construction of digital literacy.

The integration of cognitive, technical, and ethical dimensions as the core category in this study provides a significant theoretical contribution. While previous models tend to treat these dimensions as parallel components, this research emphasizes their interdependence and contextual integration. This finding resonates with contemporary frameworks in 21st-century skills education, which stress the importance of holistic competence development. However, the study also reveals a critical gap between theoretical ideals and classroom realities. The lack of alignment between curriculum design and digital literacy objectives results in fragmented skill development. This discrepancy highlights the need for a paradigm shift from technology adoption to pedagogy-driven digital transformation (Redecker, 2022; Voogt et al., 2023).

In comparison with previous studies, the current research confirms the general consensus that digital literacy is essential in the era of Society 5.0, yet it offers a more nuanced understanding of how this competence is actually constructed in real educational contexts. Unlike quantitative studies that measure digital literacy as a static variable, this grounded theory approach uncovers the dynamic and contextual nature of its development. The implication is that future research should move beyond measurement-oriented approaches toward process-oriented investigations that capture the complexity of learning experiences.

Scientifically, these findings imply that digital literacy should be reconceptualized as an emergent competence rather than a predefined skill set. Theoretically, it calls for the refinement of existing models to incorporate contextual and pedagogical variables more explicitly. Practically, it underscores the urgency of designing learning environments that integrate critical thinking, creativity, and ethical reflection into technology use. Without such integration, the promise of Society 5.0—where technology enhances human well-being risks being reduced to mere

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technological proficiency without meaningful intellectual and moral engagement.

CONCLUSION

The development of digital technology in the era of Society 5.0 has driven a significant transformation in the education system that demands the integration of human capabilities and technology in an adaptive and meaningful manner. In this context, digital literacy is a key competency that is not only oriented towards technical skills, but also includes cognitive, critical, and ethical abilities in managing information. Based on the results of the research, students' digital literacy is formed as a multidimensional construction that includes the ability to access digital information, critical evaluation, content production, and ethics in the use of technology. These four dimensions are integrated into each other in forming competencies that support an active, reflective, and contextual learning process.

Furthermore, the construction of students' digital literacy is influenced by various factors, both internal and external, such as learning motivation, intensity of technology use, the role of teachers, and the learning environment. Through a grounded theory approach, this research produces a core category in the form of the integration of cognitive, technical, and ethical abilities in the use of digital technology to support meaningful learning. Thus, digital literacy can be understood as an integral competency that develops dynamically and has strategic implications in the development of effective technology-based learning in the era of Society 5.0.

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