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# The Development of Digital Literacy in Academic Context in Indonesia: Literature Review Study

**Nazaruddin Musa[1], Norsiah Abd Hamid[2] ,Mohd Sobhi Ishak[3]**
[1]*Universitas Islam Negeri Ar'Raniry Banda Aceh, Indonesia*
[2]*Universiti Utara Malyasia (UUM), Malaysia*
[3]*Universiti Kebangsaan Malaysia (UKM), Malaysia*

nazaruddin@ar-raniry.ac.id

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**ABSTRACT**

Academics in Indonesia are currently entering an era of rapid-learning change, as experienced by academics worldwide. This change is closely related to information and communication technology, such as the Internet and increasingly digital electronic devices. That digital cycle had had a significant impact on learning and evaluation, which is drastically different from the capabilities of manual systems before the digital era came to serve users in the academic community. However, the ease of technology does bring not only good news but also this digital accompanies problems such as overload, harmful substance, network neglect, and slavery to the device itself. This literature review paper investigates the digital learning framework model in a national academic context after the main study series in the previous finding paper on the computerization skills of academics in Indonesia. The result show that the understanding the advancement of digital literacy among universities is very important to help the academic community both during college and after graduation to become a lifelong learner. It would be useful contribution to Indonesian academic work environment.

**Keywords**: *Digital Literacy, Indonesian Academic, Learning Approach*

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## INTRODUCTION

The academic era Revolution 4.0 is an era of strategic innovation progress to complete routines, formal work, and other life tasks (Bell, 2010). The progress of the media is one of the consequences of this progress. Academic assignments are constantly changing, from print to non-electronic, from books to tablets, from accurate contact to remote participation, which seems to be being faced when the Covid-19 pandemic era shook the world. So, the presence of the Internet is no longer a luxury device nowadays, but it is a significant need nowadays, especially in higher education circles (Gregory & Lodge, 2015). To ensure the use of this digital media and innovation in a competent, intelligent, wise, and responsible manner, the world new technologies with solid literacy require new capacities in understanding and correspondence as well as new intelligence (Susskind & Susskind, 2015) states that today's youth schools must be ready to transform modern-century work.

So, innovation and student training today must be constant with technology. Lippincott (2010) feels that future technology should be for academic utilities. He feels that the extraordinary computerized innovations and unwavering morals behind them in the developed world should be the solution for the future leaders of Indonesia and the world. Technology must be a perfect setting for innovating the world of learning and future work (McAndrew, 2015). The regulation of digital literacy in the academic environment is related to the need for mechanical preparation to prepare Indonesian workers born from an academic womb who must be ready to work in the era of free competition (Falloon, 2020). The authors had examined the advantages of data and information since digital technology was present, but in addition to many data explosions, incorrect data that destroyed Indonesian academic knowledge and skills confused the academic world (Sandberg et al., 2013). This era of creation evolved and learned due to the intersection of individual innovations, which were versatile, unfiltered access to information and client-delivered content in a college environment.

More harm arises from shared material, including technological savagery and disgraceful treatment, digital torture, pornography, and anything jeopardizing academics' online activities. Guidance and training on how the correct digital system should be introduced (Valjarevic et al., 2014) because not everything computerized will offer the right content for academics; if not controlled properly, then many negative impacts are problematic. Academic demands with digital presence are getting easier to handle; this is a crucial point to note, the problem of media and ICT administration must continue (Ferrari, 2013). Developing consistency in the behavior of computerized media requires an awareness of what should be safeguarded and why they should be strictly managed (Whelan, 2008). As far as consistency of inquiry, information has a causal capacity. This is why awareness-raising of educated youth with high-level skills should be prioritized using an exercise framework included in the information board to get predictable data handling accurately.

For this study arrangement to be beneficial for academics in Indonesia, Setiawan and Phillipson(2020) findings can be relied on to straighten the relationship between the use of technology on social media and academic interests and student self-efficacy science teachers in Indonesia. For this reason, this investigation investigates previous data on the meaning of digital technology innovation at the high-use stage in teaching in higher education, future HR preparation projects, problems and risks posed by computerized digital media, and training in technical skills and their use at the tertiary level should be prioritized(Kirkwood, 2014). This literature review also discusses the main issues, including how Indonesian academics can prepare students carefully in using digital technology in usability in the academic world. Utilizing this in-depth study, the author seeks to present answers to the fundamental problems mentioned above.

The solution is that with adequate digital literacy skills, the academic community, especially lecturers and students, will work in completing tasks and responsibilities in learning and research. With a study that discusses the development of digital literacy, the academic community will make better decisions because they have the proper understanding of literacy conditions in the academic world in Indonesia. It also supports academics to find information, study, analyze and communicate the results of their studies if they have a skill currently believed to be digital has succeeded in innovating the world of learning and research (Abdul Latip, 2020).

The author relies on is to coordinate the two standards as a structure that is thought to unite academic vision, regulating digital technology in terms of thinking intelligently and critically (Brundiers & Wiek, 2011). The measure is a study of academic behavior interacting with technology and the preparation of Indonesia's young workforce to face the advanced computerized era. The view of literacy skills is intended to assess understanding of the issues and ecological elements that make up a subject of study. Exploration skills are created by utilizing an appropriate information base for the exam setting (Ungerer, 2016). The essence of this action is to find relevant information and investigate its suitability to decide the importance of the problem through a hypothetical assessment. The world view of planning and science hopes to expand the boundaries of human interaction by creating new imaginative artifacts (Daellenbach & McNickle, 2012). The worldview for plan science seeks to make ancient scarcity judgments as a way to solve specific problems. The evaluation of the scarcity of conventional academic methods includes two standards of conductive science and appropriate technology in the current academic setting prepared for the future. This article investigates the digital learning framework model in a national academic context.

**METHODS**

This article intends to review the educational learning model at the computerized tertiary level as the development and innovation of science that relies on digital technology and information (Nizam & Law, 2020). A thorough review of efforts to explore the usefulness of digital literacy in academic contexts at universities in Indonesia uses various literature review methods related to learning and assessment to produce an information base related to digital literacy after exploring various application contexts (Meyers et al., 2013). Important details occur as a study of the writing and perception of existing exams on Indonesia's ICT acceptance and current push in secondary schools. To collect the data needed for this study, we have reviewed more than 50 publications. We focused on finding data with the help of electronic search engines on several international publication journals such as Willy, SAGE, ERIC, Researchgate, Springer, Google Book, Taylor & France, and Academic Journals. Next, we analyzed the data using a phenomenological approach, starting with data coding, in-depth evaluation, and extracting the essence as valid and reliable findings.

The purpose of evaluating the resulting model is to seek the truth, which is viewed with a stunning methodology, using educated assumptions of truth and explicit situations. The accompanying paper will complete the model with accompanying clarifications: relevance check, thorough investigation, logical model clarifying segments and their connections, model, and final assessment. They are investigating the relevance of the objective of a proper research examination is to identify the natural prerequisites and the importance of the problem between the teaching of academic skills in Indonesia, especially how to use digital literacy from university to postgraduate so that students and other academic communities can benefit from technological innovations called digital literacy (Meyers et al., 2013).

## RESULT AND DISCUSSION

### Technology in Academic

The findings of reporting on the use of social media technology such as the Tik Tok application for the prevention of Covid-19 as a media campaign for the Indonesian handwashing movement among students and the general public in Indonesia facing the computerization period in January 2020 reached 64.8% of the total 160 population who have used the Internet. With social media accounts, with 40 million books on Twitter, up more than 800% in recent years (Sarathan et al., 2020). In this association, it is said that the entry of equipment in Indonesia will exceed the total population of Indonesia. Web access is dynamic and pragmatic according to the value of the evolving pattern device. A PEW Research Center study shows that the measurement of mobile phone ownership in Indonesia reaches 38% between the ages of eighteen and 34 percent among long-term rangers (Darnoto, 2016; Silver, 2020)

This information shows that the Indonesian people, including the academic community, have effectively adopted computerized innovation through sophisticated web media, especially cellular phones. Mechanical skills can be achieved only in a set of advanced utility tools. This data illustrates how the Indonesian community responds to technology in all activities. With this trend, it is a challenge for academics to bring positive things to academic activities and activities so that the effectiveness of digital literacy is following academic goals and policies (Pettersson, 2018). Apart from the current progress in the use of technological literacy, the use of digital-based gadgets in Indonesia, especially academics, needs to be handled smartly and wisely how they use this technology to the level of innovation to achieve the productivity of learning and work activities in universities safely and solemnly (Aryani, 2019).

So, digital literacy training in the country must be structured and systemized with documentation in the technology and information curriculum starting at school to higher education. For unique and extraordinary academic capacities or entry points for understanding technology and informatics, which are typically used for computerization and teaching technology skills in universities (Spante et al., 2018). Given the need for student excellence to get independent in academic efforts based on digital technology. The need to adapt during an academic period with the complexity and high demands of teaching so that students can progress consistently from ordinary technology programs to levels of complexity.

However, its application must still be controlled by the university's role in several academic contexts in developed countries (Alonso, 2014). This is important so that students and academics do not confuse the nature of the framework and the impact of the technology itself. So, there is no low awareness and understanding of the academic community about the uses and benefits of digital technology. The movers to technology education, significantly higher education levels, must have a firm framework that is carried out for the younger generation and Indonesian academics. With a watch technology model with the primary goal of developing skills and information offered by individuals in academic circles on the Internet (Wilczynski, 2015). Like how to develop a healthy and wise Internet that combines the security of web-based activities and the use of the Internet that has academic and work values. This is one of the essential watch information and communication programs (Arkorful, 2021).

The ability of students towards information technology, including learning to use digital technology, adapting to new approaches as technology evolves, and minimizing the dangers in the digital environment for academic and personal circles, is part of the

primary goal of technology dissemination in the context of education (Timmis et al., 2015). Because experts believe that digital technology can enable instructors and students to change the teaching and learning process from being predominantly teacher-dominated to student-centered, generating more significant learning opportunities for students, providing and enabling student opportunities (Blikstein, 2015). Technology can affect student learning when instructors are digitally educated and understand how they can incorporate it into the curriculum in their higher education.

Academics must utilize many digital technologies for information communication, task execution, dissemination and sharing of academic content, storage, and management of submissions or communications (Fernandez & Shaw, 2021). Because technology helps instructors communicate with students and other fellow academics. Academics such as lecturers and coordinators will likely provide feedback in the preparation of their instruction. Digital technology also allows instructors to access all applications supporting applications and academic support, such as among academics at international universities in the context of colleges and universities (Vázquez-cano, 2014). It also contributes to the efficient use of technology software and instructional hardware - a learning process in which materials such as space and other stationery devices are used. All of that can be reduced by the principle of efficiency of education in saving the earth and going green through working on the screen (Agarwal et al., 2014).

The discussion of the results of this study with an emphasis on how significant digital literacy is in the academic environment in Indonesia. Holding on to the assumption that the application of digital technology can revolutionize teaching and learning evaluation in the higher education environment where previously, teaching and the academic community were all done manually (Kivunja, 2015). However, since digital technology has reached higher education, all activities have been automatically adopted into all-digital technology. This can be illustrated in various ways; for example, now the population in Indonesia, especially academics, has effectively taken and used technological advances. So in this way, computerization skills become essential and fundamental to help high-level teaching innovation and evaluation and other digital tools that will positively impact academic results and achievement (Kivunja, 2014).

Furthermore, besides the hole in Indonesia's technological progress in the education sector, this does not necessarily lead to a positive direction. However, if technological activity in academics is not aligned with understanding and control, then positive things will turn negative, both in terms of connection factors. The Health, mental, and mental health of academics, especially students, are unseen by technology users (Levecque & Anseel., 2017). Therefore, the limitations are due to the impact of infrastructure and the development of scientific civilization and computerized innovations in all academic fields. The earnest efforts of the technology management of universities, including digital technology specialists or creators, are centered around computerized skills education in the academic environment. The current conditions in the Indonesian academic context require and offer studies that may not be without the preparation of something new but to contribute and resolve problems that may arise in the future even though they have not been seen at this time (Hidayati, 2016).

The current status of each effort and position of the study of technology studies and applications among academics for this activity is described in many similar studies. Recent studies are centered around the delivery of higher education findings

and content, driven by technologists because trained academics are good examples for the younger generation of technology who are not yet fully competent in both the positive and negative impacts of erroneous acceptance of technology for educational purposes (Haydn & Ribbens, 2015). Every opportunity for academic juniors and school youth, including guardians, educators themselves, must gain understanding and adequacy of knowledge that will participate in educating computerization skills in their younger generation so that teachers can experience the impact of mistreatment and acceptance of the technology on academic contexts (List, 2019).

**Digital and Academic Data**

For high-level skills possessed by digital data, academics must adopt digital for educational progress (Raju, 2014). Through this digital data innovation, instructors can offer different learning and practical experiences for digital technology organizations that create learning innovations for academic achievement in higher education (Alexander et al., 2019; List, 2019). As higher education skills managers with their digital-assisted practice, they can work closely with academic colleagues to share learning innovations and develop learning outcomes for their students. For this reason, computerized digital legal academics in the learning environment, especially during pandemic disturbances, rely on distance learning (Pelletier et al., 2021). For instructors and students, this is a development solution to find a safe way from pandemic anxiety to use computerized gadgets adequately so that learning activities do not stop. Educators can also see this as an opportunity to increase their range of skills and grow with their students even though the world is still in a pandemic. Many academics take their computerization skills to a higher level by gaining a high level of understanding in learning innovations in the digital era (Wyckhuys et al., 2017).

All that we have reviewed above have motivated the academic community to get practical computerization skills. Because the learning model in higher education implies that the community must have what digital literacy skills are needed to live independently, learn autonomy, and work in the community after graduation where correspondence and data reception develop through computerized innovations such as web platforms, online media, and mobile phone technology (Parasie et al., 2013). Furthermore, the collection of computerized information in an academic environment reduces the possibility of errors at the information collection point in the field and can also undermine the evaluation of information. By preparing and evaluating information much more quickly, errors are caught and adjusted much more quickly for repair (Altbach et al., 2019).

When viewed from the point of view of the benefits of information in high schools, the advantages of using computerized information can help academics make educated choices and carry out online executions. Likewise, digital literacy is consistently 100% precise in work academic services, as digital information allows them to get a good deal on disconnected examinations (Barber et al., 2015). In other words, using computerized information allows academic activities to get more audience practically. Likewise, using digital information on computerized information can store very complex data, such as music, movies, and games can also be saved. Another reason digital is so supportive is why digital data is so important. Because (Jaillant, 2019).

**Management of learning**

To be sure, learning management has a digital system or solution through the use of software that combines complex databases with digital frames (Unwin et al., 2010). It allows users to trade, produce, distribute, manage and monitor materials through an efficient platform. Sometimes called learning management, software applications cover all aspects of the learning process, where students store, share and monitor academic materials in the community (Sarrab et al., 2016). Learning can be seen as an interaction in which the student selects and makes helpful information and uses it independently to lead and characterize his ongoing learning process. Learning interaction is a cycle of acquiring data and handling it. Learning in contemporary constructivist education is not just the transmission of data; development work is very individual. Creating is building understanding and information to empower behavior that is more developed and dynamic. Data for implementers is the starting point for collecting, reviewing, and compiling information in specific fields to assist learning interactions. The turn of events and variation of unique information to instructive targets might be portrayed as the process.

**Advanced media in academic**

Digital proficiency conversation separated from the computerized expression innovation. The contraption, characterized as a cell phone used to draw in with advanced media (text, pictures, music, recordings, projects, games, and online correspondence between at least two individuals), addresses computerized innovation as a recognizable word for regular use. In its assertion (Simon & Bibri, 2013), the European Information Society said that advanced education implies individuals' mindfulness, approach, and capacity to utilize computerized apparatuses and offices suitably to distinguish, access, oversee, coordinate, assess, dissect and integrate the Digital Resources, assemble information new to them, make media articulations and convey in exact circumstances of life. Give computerized media clients thorough information that accommodates their capacity and purposes; the definition mirrors this investigation system. The learning material might be cultivated through three parts of computerized proficiency: specialized, psychological, and social-enthusiastic.

A specific code of conduct should be set up to achieve this goal. Be followed. The three columns expanding on learning are objective-based information with a specific set of principles: vision, confidence, confidence, issue, and challenge. Vision implies accomplishing long-haul objectives. This goal was like this converted into a primary goal with a more limited period and subtleties. The vision of this learning framework is to get ready Indonesian residents, youngsters, and grown-ups for advanced instruction, abilities, and perspectives in the utilization of computerized innovation for regular daily existence and exercises. Most of Indonesia's strict standards are established on the conviction and confidence of citizens. Both of these are essential standards about what individuals ought to do, how to do things effectively, how to associate. Issue and challenge are answers for the shrewdness of undeniable level perception of information.

**Information Travel**

Information is constantly moving and changing, so academics must store, handle, and prepare to transmit the information as learning material (Mizrachi & Bates, 2013). The data obtained is about computerized education with a wide range of conversations that combine three advanced skills sections. Information as a learning asset arises as

questions about what and how, best practices, tips and procedures, opportunities for problems, and how to solve them. Through the three types of movement, spread, and execute, students gain objective knowledge. Dissemination of further education awareness using open data accessible through all system interfaces. The what and why questions are answered through scattered information. It is handled and given to the general public. Spread combines work with explicit students. The individual learning profile of students is essential to this movement. This kind of learning material reveals how to do and how to follow data. Actions are taken to make changes in behavior. Outreach and execution are completed through universal cooperation. The mastery that is accommodated in carrying out the exercise tends to be problem-oriented. Specialists and professionals are the leading proponents of this kind of data. The information base can be improved through coordinated efforts with past and future computerized education programs (Knight & Littleton, 2015).

**Assessing students**

Students' understanding of computerization skills needs to be continuously studied and evaluated (Papastergiou, 2009). The level of information and material is assessed for understanding. Five levels of understanding add immediate clarity. The five are skill, ability, aptitude, best practice, and mastery in problem-solving situations. Content size identifies with an advanced scientific categorization of blooms. An individual/profile characterizes an individual or set of highlights characterized in at least one of the following classifications: primary purpose, age, occupation, grade, information level, and substance level (Bloom et al., 2012). These highlights are suitable for all parties involved as buyers of computerized media where students are highly skilled. Students' understanding focuses on a predictable mentality in the appropriate and appropriate use of digital innovations and on the ability to work with the ability to use digital information and technology in a higher academic environment (De-Sola et al., 2017; Fonseca et al., 2018). As we asked in the beginning, the primary purpose of this study is to understand the development of digital literacy in the academic environment in Indonesia (Yildiz et al., 2020)). So from a series of studies that we carried out, we managed to gain an understanding of digital literacy among Indonesian academics, which shows that up to now, Indonesian students and lecturers already have the digital literacy skills they need to be able to continue learning and working in an academic sphere that requires skills from understanding to understanding.

Apply academic digital in completing assignments and work that requires a research component that a combination of literacy and research can help. Kumasi (2014) said that communication and access to information are continuously increasing through digital technology such as virtual learning platforms, social networking, and mobile and computer infrastructure so that we get an understanding as a final finding that digital literacy is progressing very rapidly compared to the learning era before the digital era or the 4.0 revolution when we were still in high school (Ayyildiz, 2021). Through evidence as said Pagani at al. (2016)that our study of digital literacy in the academic environment in the country confirms that its application to the environment, especially in universities, has shown an effort that is not only in mastering technology applications in everyday use but academic people in Indonesia have applied digital skills of this technology to the use of accelerated learning whose learning content components require digital literacy skills (Dewi et al., 2021)Furthermore, our study distinguishes our study from the previous one because our study asks why academics

such as students and lecturers need to master digital literacy in the current era of learning. The answer to the results of our study is that with this finding, academics' digital literacy skills will be able to quickly access and search for additional material in digital media, especially now that academic activities of all domestic and foreign institutions (Balyer & Oz, 2018) rely heavily on the power of technology. Digital literacy is present as a support so that digital media can be used and used as an additional reference source for lectures so that during this pandemic, academics can continue to be updated with world changes and progress (Kado et al., 2020) The advantages and contributions of our findings include that by gaining an understanding of the development of digital literacy in the academic environment, at least academics will have an understanding and be able to provide an innovative framework to continue learning. With digital tool competency, Effective teaching activities to complete all academic tasks, especially activities learning and final work (Alexander et al., 2017). Because typical academic assignments require fluency in digital skills, academics will quickly dispel all the continuous flow of information required by scientific assignments. Our findings also include understanding how students need to be proficient at presenting their work, relying on digital technology by creating or viewing technology, and assisting students in data analysis and research studies that require critical digital skills (Šorgo et al., 2017)

The final part of the contribution of this finding is where understanding the advancement of digital literacy among universities is very important to help the academic community both during college and after graduation to become a lifelong learner. These findings also teach us, researchers, that literacy skills are essential and academic skills for improving the quality of learning outcomes, especially when the academic world needs technology in responding to distance learning using digital technology. They help students use critical thinking skills to evaluate the quality of sources and information. (Castilla et al., 2018; Gómez-Galán et al., 2020) So that with this study, we also understand that digitally literate academics in technology will be able to improve the quality of their academic work by having the ability to easily access online sources of information and data such as library databases and correspondence between lecturers and lecturers students (Alexander et al., 2017; Fedorov & Levitskaya, 2020). That way, the digitally literate academic community will save time and funding, access everything online, carry out activities remotely, and do tasks that cannot be done manually.

## CONCLUSION

In this final section, we present a series of studies that aim to examine various kinds of literature on digital literacy in an academic context in Indonesia. We believe that this review has fulfilled this goal by presenting valid findings, presenting facts, and understanding how the effectiveness of digital literacy supports academic activities that are increasingly remodeling learning activities since technology has become the primary choice in the last few decades. The question of this study tends to propose a digital literacy learning framework model that is coordinated in an information base adapted to the eccentricities of the Indonesian academic environment. The digital division in Indonesia does require the preparation of young academics such as university students through various methods of transferring data and information to support learning and work. The explicit casual effort at digital literacy skills instruction with parenting is an excellent example of providing college to all those who teach. Indonesia is a country that has quite a lot of academics.

Furthermore, young people's digital skills must follow the demands of the academic world and work after graduation. The superior strategy that has been adopted shows that students' digital understanding and the main objects are needed for various types of preparation so that they can use technological literacy according to their academic and future work needs. Different levels of understanding and reasons students need different types of information and evaluating levels of understanding as needed. Each segment of student and academic skills in higher education requires the broad inclusion of digital technology education instruction in the Indonesian academic context. The practicality of this worldview is reproduced and advocated by utilizing state-of-the-art technology models.

Therefore, this study and examination begin with the results of the views of experts and the findings of previous studies that have been widely published. This research methodology requires further studies of efforts to improve the digitalization area of higher education for a series of elements: a comprehensive higher education plan for each capacity and group of higher education students expressed in special needs in interpreting the best data obtaining new inputs. Further studies will be carried out to prepare educational control and assessment frameworks for high-literacy digital skills.

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**AUTHOR CONTRIBUTION STATEMENT**

The first author may have contributed the most; however, as a postgraduate supervisor, I certainly could not have done much without the contributions of the two authors. So, we declare that this study is shared work, and the parties do not have any conflict in carrying out this task. The first writer is the initiator; the second and third writers always provide academic and professional guidance and advice. Thus, the statement of the author's contribution we convey and hopefully all can understand it.

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