Analysis of College Student Technology Literacy and Information Literacy Skills: E-Learning Activities Based on Online Platforms in Higher Education

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Abstract: Online platform-based e-learning makes use of a variety of technologies as communication and information mediums, encouraging students to engage in productive and worthwhile learning activitiesThis study intends to ascertain the abilities and impact of students' technological and informational literacy on their participation in online learning activities for e-learning. A descriptive quantitative research methodology is used here. Universitas Samudra and Universitas Islam Riau were the sites of the research, which took place from June to August of 2023. Students in the 155-student sample population of the Biology Education Study Program. Using google forms, interviews, and observations, a random sampling technique is used. Validation and reliability tests were conducted on the research instrument. The use of technological devices to obtain information falls into the very good category; locating available technological devices and using technological devices fall into the good category; while the use of technological devices for self-development falls into the moderate category, according to research on technological literacy skills. Information literacy among students in higher education is significantly influenced by technical literacy abilities, with an influence of 63.6%, according to the significance value (sig) $0.00 < (\alpha)$ 0.05, which means that Ho is rejected and Ha is approved. According to the regression equation $Y = 0.237 + 0.922X$, the value of information literacy abilities will rise with each increase in the value of technology literacy skills. the significance of improving students' technology and information literacy skills in higher education to prepare them for the era of the digital revolution.

Keywords: E-Learning; Information Literacy; Online Platform; Technology Literacy

Introduction

The knowledge acquisition process in higher education must be accelerated and transformed quickly due to the rapid development of information and communication technology. Different technologies are used in education as a means of communication and information. The teaching and learning activities that aim to enhance learning outcomes can be maximized by e-learning (Azrai et al., 2023). With technology tools and internet networks, e-learning can be conducted online by accessing, managing, organizing, and evaluating activities and learning results (Maphosa & Bhebhe, 2019). The use of e-learning in higher education promotes an efficient and fulfilling learning process and makes it easier for students to find information and data for learning activities such as lecture activities, task completion, research studies, and other activities (Arifin & Setiawan, 2022).

To give materials online, e-learning provides easily available learning activities (Asrizal et al., 2022). According to Violante & Vezzetti (2012), an online e-learning platform is a program created for learning activities that can be accessed online. It offers access to information on lecture materials, independent projects, discussion forums, and assessments of learning outcomes. The Kahoot program (Gani et al., 2022), Cloud Classroom (Aulia et al., 2023), and Edmodo (Permana & Chamisijatin, 2019), among others, can be accessed for free or a fee. Technology devices like laptops and smartphones that are connected to the internet network by LAN hotspot wifi or mobile data internet packages (providers) are integrated with this online platform application. The usage of online platforms-based e-learning is a learning strategy that can boost activity and flexibility in online learning in higher education.

Student readiness to grasp new technological applications made up of many and various online platforms is one of the concerns and obstacles that must be tackled by students in the current state of online platform-based e-learning learning in higher education. The capacity of university resources to support e-learning based on online platforms and students' readiness to acquire comprehensive and endless knowledge without being able to verify the veracity of the information. The findings of earlier research (Hicks & Lloyd, 2020) demonstrated that students' information literacy in higher education is still low as a result of undervaluing other information that can be accessible through communication outside of subject matter. The mastery of fundamental skills that students must possess, such as technology literacy and information literacy, is what determines the effectiveness of e-learning based on online platforms (Burhanuddin & Makmur, 2022).

During the digital revolution, pupils will need to possess several fundamental skills, including technological literacy and information literacy (Mubasiroh, 2023). The ability to use, access, and integrate technological applications to acquire the appropriate knowledge is known as technological literacy (Kabakus et al., 2023). The capacity to gather, manage, and synthesize information is known as information literacy (Saman et al., 2019). Students' ability to find reliable information sources, confirm the accuracy of that information and use that information intelligently to address issues in their study and the real world depends on their information literacy skills (Bruce, 1995).

To ensure that learning programs can be completed in the digital age with open access to information, higher education policies are required (Basili et al., 2022). The significance of technology proficiency is to promote students' information literacy abilities (Chen et al., 2022). In higher education, it is necessary to evaluate students' technological and informational literacy skills to identify the actual challenges that students have when using the present online learning environment for e-learning (Nikou & Aavakare, 2021). This research is very important to analyze the digital literacy skills of university students in e-learning interactions with online media platforms. Online platform-based learning is often carried out in universities so data is needed on how students' knowledge and understanding of using the technology used during learning can improve their mastery of lecture material. As well as exploring students' skills in absorbing information obtained during e-learning activities via online platforms. This study aims to examine students' technological and informational literacy levels and ascertain how those levels affect students' informational literacy in online learning activities. The findings of this study serve as a basis for developing innovative e-learning-based learning models that are tailored to the needs of students in higher education and for enhancing students' digital literacy.

Method

A descriptive quantitative research methodology is used in this study. From June to August 2023, the study was carried out. Locations for research include the public Universitas Samudra and the Universitas Islam Riau. The population of this study consisted of 155 students from the Biology Education Study Program. technique of random sampling. Using Google Forms, interviews, and field observations to collect study data. Tables 1 and 2 describe the research tools for information literacy and technical literacy, respectively. With a significant value of <0.05 (valid) for each of the 36 statements, the Pearson Correlation Test was used to evaluate the validity of the instrument. Each statement from the questionnaire that passed the reliability test using the Cronbach Alpha method was classified as reliable. Indicators of student information literacy and technical literacy are derived from the analysis of Likert scale data from surveys using descriptive statistical tests. To examine the impact of technological literacy on information literacy, a straightforward simple linear regression test was used. The Classical Assumption Prerequisite Test, which includes the Autocorrelation Test, the Residual Normality Test, the Linearity Test, and the Heteroscedasticity Test, is conducted. This research scheme is basic research regarding literacy skills in the use of technology and information literacy in online platform-based e-learning learning content for students in higher education.

Table 1. Technology Literacy Questionnaire Instrument

Indicator	Statement
Identify Technology tools available	I have access to gadgets like a laptop and a smartphone.
	I installed the e-learning program on my technology device.
	I have the technical ability to connect technology to the internet network.
Use of technology devices	I am skilled in activating and deactivating technological devices by protocols.
	I am competent with technological devices.
	I am competent at using technology on myself.
Use of Technology Tools to Obtain Information	I'm still using my email address.
	For class tasks, I frequently search the internet for information.
	During courses, I access websites, journals, and e-books to read material.
Use of Technology Tools for self-development	I consistently take online classes.
	I provide material on a personal website.
	I participated in part in internet webinars for scientific activity.

Source**:** (Arifin & Setiawan, 2022; Santosa, 2022)

Table 2. Information Literacy Questionnaire Instruments

Indicator	Statement
Information finding and selection skills	I believe that the online learning platform (e-learning) has content that meets the requirements of online lectures.
	I believe that the online environment (e-learning) is beneficial for online debates and learning.
	I can independently organize the material from lectures.
Skill in identifying the truth of information	I can recognize content that is acceptable for the lectures presented online.
	The content of the information offered on the internet platform is simple for me to understand.
	Without assistance from lecturers or friends, I can comprehend the information offered on the web platform.
Information construction skills	Independently from the information offered on the web platform (e-learning), I can summarize the subject.
	I can re-explain the material's topic thanks to facts I learned from the online learning platform.
	Based on what I've read and learned from internet forums, I can combine information.
Information communication skills	The content of the information offered on the online platform (e-learning) allows me to thoroughly explain the subject to my students.
	I am competent to communicate the information obtained from the online platform's (e-learning) materials.
	I am competent to respond to questions from others in class using the e-learning platform's course materials.

Source: (Belanger et al., 2015; Irhandayaningsih, 2021; Rusydiyah et al., 2020)

Results and Discussion

Technology Literacy Skills and Student Information Literacy

According to research findings on university students' information literacy and technical literacy in online learning activities, there are four important areas to consider. Technological literacy skills are known, with scores in the following categories: identifying available technological devices (82.5 percent; good category); using technological devices (84.8 percent; good category); using technological devices to obtain information (90.1 percent; very good category); and using technological devices for self-development (69.5 percent; fair category). The information literacy abilities of the students are known, including the ability to locate and select information with a score of 79.2 (good category), the ability to determine the veracity of information with a score of 74.3 (good category), the ability to create information with a score of 75.1 (good category), and the ability to communicate information with a score of 74.7 (good category).

The primary skills that students in higher education must possess are technological literacy abilities. The information accessible on the internet database will be able to correlate with the academic activities of the students. Kolesnyk et al. (2020) assert that students need to be adept at using technology to rationalize their intellectual pursuits. According to the study's findings, students' technical literacy is very good to good. This is demonstrated by the fact that students own technological tools that enable the online platform-based e-learning learning process, such as laptops and

Android smartphones. Daily activities help children become more technologically literate, so they are used to recognizing devices, utilizing them, and conducting online searches. According to research (Fatmawati & Safitri, 2020), technological literacy abilities and information literacy are in the good category in higher education. The necessity for students in higher education to possess technical literacy abilities is brought on by the activity of employing internet-integrated technology (Chen et al., 2022).
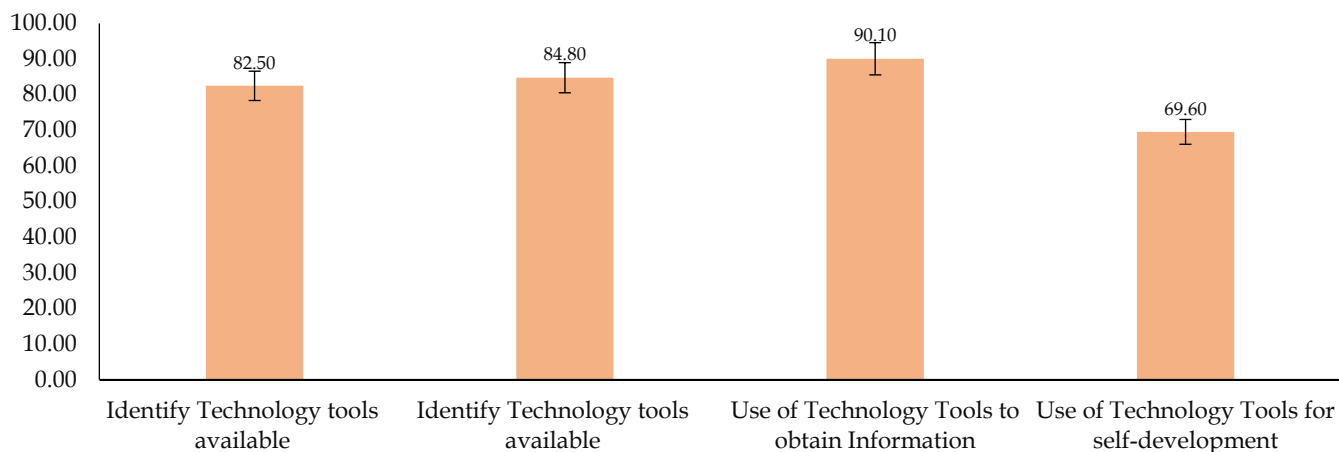

Figure 1. Technology Literacy

Students in higher education still fall under the adequate category in one area of technological literacy, which is the use of technology for self-development. Due to the learning process that can be spread through digital media, students are nevertheless restricted in their use of technology. The significance of education in the digital age and how information can be obtained and shared with the public to profit from recent scientific advancements. The actual way that students can use technology for self-development is through online learning communities that are packed with previously studied lecture materials and where knowledge is freely shared on the internet.

Higher education students already have good information literacy abilities. However, it is important to increase students' information literacy so that the data they learn during lectures may be widely retrieved and filtered using accurate and reliable knowledge. With the digital transition, the amount of information is expanding very quickly, necessitating information literacy abilities to filter accurate and legitimate information (García et al., 2021). Given the rapid advancement of science, students must constantly refresh their knowledge. By updating the most recent information from numerous scientific articles that are available in internet databases, students must get a variety of forms of information (Strader, 2021). To encourage students to engage in productive academic activities, information literacy programs are pushed in institutions (Pinto et al., 2021).

The Effect of Technology Literacy Skills on Information Literacy

Based on the results of the research data obtained, the classical assumption prerequisite test is carried out, namely, the Residual Normality Test obtained the Asymp value. Sig. (2-tailed) 0.20> 0.05, it is stated that the data is normally distributed. Followed by the Linearity test obtained Deviation from Linearity 0.41> 0.05, it is stated that there is a significant linear relationship between the technology literacy variable and information literacy. Then the Heteroscedasticity test was carried out with the Glesjer test technique to obtain a Sig value. 0.98 > 0.05, it is concluded that heteroscedasticity does not occur, so it can be continued with the Simple Linear Regression test.

The simple linear regression test results obtained an R of 0.79 which means that the magnitude of the relationship between the two research variables is 79.7%. The coefficient value is 0.64, which means that the effect of technological literacy on information literacy in students in higher education, with online platform-based e-learning learning activities is 63.6%. The regression equation obtained Y 0.237 + 0.922X, means that it has a positive direction of influence, for every 1% increase in the value of technological literacy skills, the value of information literacy skills will increase by 0.922. Furthermore, the significance value of Sig.0.00 < 0.05, it is concluded that technological literacy skills have a significant effect on student information literacy skills in higher education, in e-learning learning activities based on online platforms. Simple Linear Regression test results can be seen in Table 3 and Table 4.
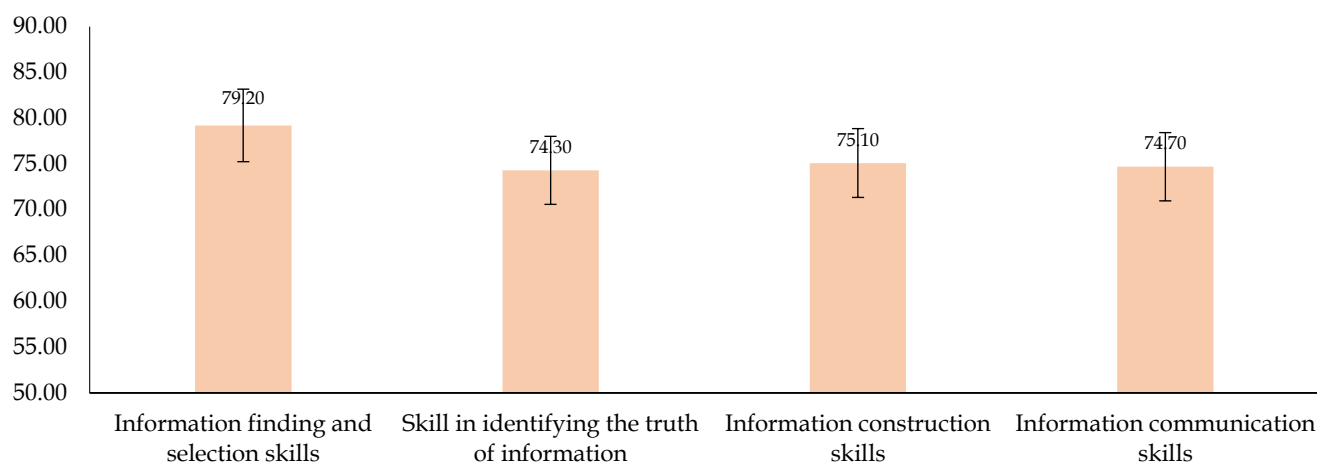
Figure 2. Information Literacy Skills

Table 3. Model Summary Simple Linear Regression

Model	R	R Square	Adjusted R Square	Std. Error of The Estimate
1	0.797	0.636	0.633	4.42

a. Predictors: (Constant) Literacy_Tehcnology

Table 4. Coefficients Regression

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1 (content)	0.237	2.793		0.085	0.933
Literacy Tehcnology	0.922	0.056	0.797	16.33	0.000

a. Dependent Variable: Literacy_Information

The results of this study show a strong connection between information literacy and technology literacy abilities. The relationship between students' technological literacy and information literacy is favorable, which means that as students become more adept at using the numerous technological tools at their disposal, their literacy levels will also rise. According to Rusydiyah et al. (2020), students have good views and abilities while using digital literacy as a learning resource.

For students to succeed in information literacy in the subject matter they are studying, they must have the technological literacy abilities necessary to manage the digital environment (Cordell, 2013). Students' digital literacy abilities will develop as a result of their learning habits through online e-learning platforms (Hamutoglu et al., 2019). Online e-learning platforms give students a place to engage in productive learning activities like accessing course materials, and lectures, and uploading previously learned content (Sarker et al., 2019).

Integrating information literacy instruction into the higher education learning curriculum is one way to ensure that all students have access to information (Basili et al., 2022). One of the skills needed to receive information via digital methods and transform it into new knowledge is information literacy (Sanches et al., 2022). Information literacy and the attainment of student learning outcomes in higher education are related (Flierl et al., 2021). By providing training and altering the academic culture for students in higher education, the success of reaching learning objectives through online e-learning platforms needs to be increased (Mashau & Nyawo, 2021).

Conclusion

Students in higher education benefit from having technological literacy abilities in terms of information literacy. Both positively influence one another, so that as technical literacy abilities advance, so do information literacy skills. The use of technological devices to obtain information falls under the excellent category; finding and using available technological devices falls under the good category; and using technological devices for self-improvement falls under the sufficient category. These four main indicators represent technological literacy skills. The information literacy abilities of students are known, including the abilities to locate and select information, determine the veracity of that information, create information, and communicate that knowledge. The significance of enhancing pupils' technological and information literacy abilities to prepare them for the digital age.

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