The Influence of Digital Information Literacy on Student Learning Outcomes

Nurlita Lestariani
Universitas Islam Negeri Mataram
nurlita@uinmataram.ac.id

Abstract

Digital information literacy is the ability of a person (student) to access relevant and digitally sourced information, organize data, analyze, criticize, and disseminate data, use data to solve problems, and communicate data effectively and efficiently. Digital information literacy is an important competency and learning and is needed for personal and professional life. However, empirical analysis regarding its effect on learning outcomes is not widely known. This research aims to analyze the influence of digital information literacy on learning outcomes. This research applies a quantitative approach and is an ex post facto type of research. Participants in this research were 42 students who took the Animal Ecology course in the 2022/2023 academic year, in the Biology Science Education Department, Tarbiyah and Teacher Training Faculty, Mataram State Islamic University. Digital information data literacy is collected using a questionnaire while learning outcomes are measured using tests. The data was analyzed inferentially through a simple regression test with the help of SPSS version 22. The results of the analysis showed that there was a significant linear relationship between digital information literacy and learning outcomes (sig. = 0.197). The residual distribution between the known variables is digital information literacy and normal learning outcomes (sig. 0.076 > 0.05). Regression analysis shows that there is a significant influence of digital information literacy on learning outcomes (sig. = 0.05) with an F value of 3.96.

Keywords: *Digital Information Literacy, Learning Outcomes, Influence*

Abstrak

Literasi informasi digital merupakan kemampuan seseorang (pelajar) untuk mengakses informasi-informasi yang relevan dan bersumber dari digital, mengorganisasikan data, menganalisis, mengkritisi dan mengevaluasi data, menggunakan data untuk memecahkan permasalahan, dan mengkomunikasikan data secara efektif dan efisien. Literasi informasi digital merupakan salah satu kompetensi penting dan pembelajaran dan dibutuhkan bagi kehidupan pribadi dan profesional. Namun, analisis empris mengenai pengaruhnya terhadap hasil belajar belum banyak diketahui. Penelitian ini bertujuan untuk menganalisis pengaruh literasi informasi digital terhadap hasil belajar. Penelitian ini menerapkan pendekatan kuantitatif dan jenis penelitian ex-post facto. Partisipan dalam penelitian ini ialah 42 orang mahasiswa yang mengikuti matakuliah Ekologi Hewan pada tahun ajaran 2022/2023, di Jurusan Tadris IPA Biologi, Fakultas Tarbiyah dan Keguruan, Universitas Islam Negeri Mataram. Data literasi informasi digital dikoleksi dengan menggunakan angket, sedangkan hasil belajar diukur dengan menggunakan tes. Data dianalisis secara inferensial melalui uji regresi sederhana

dengan bantuan SPSS versi 22. Hasil analisis menunjukkan terdapat hubungan linear yang signifikan antara literasi informasi digital terhadap hasil belajar (sig.= 0.197). Distribusi residual antara variabel literasi informasi digital dan hasil belajar diketahui normal (sig.0.076 > 0.05). Analisis regresi menunjukkan bahwa terdapat pengaruh yang signifikan pada literasi informasi digital terhadap hasil belajar (sig. = 0.05) dengan nilai F sebesar 3,96.

Keywords: *Literasi Informasi Digital, Hasil Belajar, Pengaruh*

INTRODUCTION

The influence of digitalization on the world of education is getting stronger and can be felt in everyday life. Advances in information technology have changed students' learning paradigms, allowing them to access various digital resources such as websites, databases, and learning software. However, the availability of technology and the ability to operate these devices does not necessarily improve learning experiences and outcomes (Adhikari et al., 2017).

The use of digital learning resources, such as digital textbooks, online courses, and online learning platforms, is increasingly widespread at various levels of education. The integration of digital and online learning includes website browsing, data search, and data management (Chen et al., 2010). In this context, digital information literacy becomes crucial to help students optimize their learning potential. Therefore, the ability to manage, evaluate, and use digital information effectively has become an essential competency for students.

Serenko et al., (2012) stated that information literacy refers to ability of knowing when information is needed and the ability to effectively find, evaluate, and use the required information. Digital information literacy includes the ability to identify information that is accurate, relevant, and credible.

Through digital information literacy, students are expected to have the ability to identify more relevant literature, using scientific databases, compared to using standard search engines (Weber et al., 2018). This will show differences in the quality of information sources. In limited time, adequate understanding of the use of scientific databases and effective skills in operating search engines, become very crucial factors. This is the key to obtaining reliable and relevant information.

Students who have strong digital information literacy tend to be more motivated in learning. They feel more confident in searching for the information needed to complete their assignments and perceive improved learning outcomes as a result of their efforts. Students who have mature digital information literacy are more likely to carry out critical analysis of various sources of information, which in turn can improve their understanding and learning outcomes. This ability supports the development of critical analysis skills which are very important in the learning process.

Previous research shows that digital literacy plays an important role in improving student learning outcomes (Yusuf, 2019). Information literacy skills have a positive effect on student learning outcomes (Rahman et al., 2022). Other research shows that students' digital literacy has a positive effect on student learning

outcomes, with learning motivation as a moderator variable (Soraya et al., 2023). Students with higher levels of digital information literacy are thought to tend to achieve better results in tests and assessments. This is because they have a better ability to answer exam questions accurately and in detail. After all, they are able to search and assess information effectively.

Therefore, knowledge and empirical research regarding the influence of digital information literacy on learning outcomes is very important. However, there have not been many publications regarding the analysis of the influence of digital information literacy on learning outcomes, especially in Indonesia. Most empirical studies in Indonesia have shown the influence of digital literacy on learning outcomes, but are not specific to digital information literacy. This background strengthens the basis for researchers to test or analyze the extent to which digital information literacy can influence student learning outcomes.

METHODS

This research uses a quantitative approach and is an ex-post facto type of research. This research aims to analyze the influence of digital information literacy on student learning outcomes. There are two variables examined in this research, namely digital information literacy (X) and learning outcomes (Y). Participants in this research were 42 students taking Animal Ecology lectures, at the Biology Science and Science Department, Faculty of Tarbiyah and Educational Sciences, Mataram State Islamic University. Digital information literacy data collection was carried out using a questionnaire instrument via Google form. The questionnaire was prepared using a Likert scale (1-5) and has been tested quantitatively for both validity and reliability. The validity and reliability of the questionnaire were analyzed using Pearson correlation and Cronbach Alpha, via SPSS 22 software. Learning outcome data was obtained from the accumulation of learning outcomes (cognitive and psychomotor) carried out during one semester. Data were analyzed quantitatively using inferential methods, after meeting the assumptions of linearity and normality. The residual normality test values are normally distributed and are considered to have fulfilled the Central Limit Theorem (CLT) assumptions. Next, the influence of variable X on Y was analyzed using a simple regression test using SPSS 22 analysis software.

RESULTS AND DISCUSSION

The questionnaire instrument is analyzed quantitatively to determine the level of validity and reliability of the instrument, so that it can be concluded whether the instrument is suitable for use. The digital information literacy questionnaire contains 20 positive and negative statements. Analysis of the validity and reliability of the digital information literacy questionnaire is presented in Table 1.

Table 1. Validity and Reliability Analysis of the Questionnaire.

Analysis	α	Significance
Pearson-Correlation validity	0.05	0.00 – 0.013
Cronbach-Alpha reliability	0.05	0.87

Validity analysis of the 20 statement items shows a significance value of <0.05, so it can be concluded that all statements in the questionnaire are valid. Questionnaire reliability analysis was carried out to test the reliability of the questionnaire. The results of the analysis show a Cronbach-Alpha value = 0.87 > 0.7, so it can be concluded that the digital information literacy questionnaire is reliable for use in research.

Preliminary analysis of classical assumption tests in regression is applied in this analysis. The assumption tests carried out are linearity and normality. Analysis of the linearity assumption of the digital information literacy variable (X) on learning outcomes (Y) is shown in Table 2.

Table 2. Analysis of Linearity Assumptions.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
HASIL_BELAJAR * LITERASI	Between Groups	(Combined)	702.962	21	33.474	1.636	.138
		Linearity	100.349	1	100.349	4.904	.039
		Deviation from Linearity	602.614	20	30.131	1.472	.197
	Within Groups		409.291	20	20.465		
	Total		1112.253	41			

Table 2 shows a significant linear relationship between the digital information literacy variable (X) and learning outcomes (Y) (sig=0.197 > α=0.05). Next, the second assumption, namely the Kolmogorov-Smirnov normality test, is shown in Table 3.

Table 3. Analysis of Normality Assumptions.

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		42
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	4.96795710
Most Extreme Differences	Absolute	.129
	Positive	.129
	Negative	-.105
Test Statistic		.129
Asymp. Sig. (2-tailed)		.076[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Table 3 shows the significance value of the normality test of 0.076. This significance value is higher than α=0.05, so it can be concluded that the residuals of the two data groups, digital information literacy (X) on learning outcomes (Y), have a normal distribution. Because the assumption test has been met, the regression analysis can be continued to analyze the model of the influence of digital information literacy (X) on learning outcomes (Y).

The results of the regression analysis on the influence of digital information literacy (X) on learning outcomes (Y) are shown in Table 4.

Table 4. Simple Regression Analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100.349	1	100.349	3.967	.053[b]
	Residual	1011.905	40	25.298		
	Total	1112.253	41			

a. Dependent Variable: HASIL_BELAJAR
b. Predictors: (Constant), LITERASI

Table 4 shows the regression analysis of the influence of digital information literacy (X) on learning outcomes (Y). This analysis shows that there is a significant influence on digital information literacy on learning outcomes (sig 0.05 ≥ α 0.05). Even though digital information literacy is proven to have a significant influence on learning outcomes, the F value (F_{count}=3.96) shows that this influence is still in the weak category.

Table 5. Simple Regression Coefficient

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	68.473	7.340		9.329	.000
	LITERASI	.196	.099	.300	1.992	.053

a. Dependent Variable: HASIL_BELAJAR

Based on the data listed in Table 5, it is known that the constant coefficient (a) is 68.47 and the regression coefficient is 0.196, so that the regression equation is obtained, namely Y = 68.47 + 0.196 X. This equation can be determine as; 1) the consistent value of the digital information literacy variable is 0.196; 2) The regression coefficient of 0.196 shows that for every 1% additional digital information literacy, the learning outcome value will increase by 19.6%. The

regression coefficient is positive, so the direction of the influence of digital information literacy on learning outcomes is positive. Furthermore, based on the correlation value (r) of 0.30, it shows that the correlation between digital information literacy and learning outcomes is quite strong.

Generally, technology in learning has the potential to improve learning outcomes (Adhikari et al., 2017). This statement supports the results of the analysis which concludes that the regression model which states that there is a significant influence of digital information literacy on learning outcomes is acceptable. This statement is also supported by the research results of Arima et al. (2022) and reinforced by the research of Lingga et al. (2022) which states that digital information literacy has a significant positive effect on learning outcomes, with an influence value of 26.1%.

Other research conducted by Giovanni & Komariah (2019) shows that information, communication and digital competencies which are part of digital information literacy have a significant relationship with student learning outcomes. Kajin (2018) stated that digital-based learning can significantly increase motivation and cognitive learning outcomes.

There are several factors that support the influence of digital information literacy on learning outcomes. First, easy access to information creates a more flexible learning environment and increases motivation (Hanze et al., 2023) so that it has implications for academic performance and learning outcomes (Demir & Akpinar, 2018). Second, students can obtain broad and varied information without the limitations of space and time. Apart from that, tutorials or simulations available on the internet can make it easier for students to understand information and master certain skills. The variety of applications or software available for free on the internet also makes it easier for students to be creative and choose the way/method of learning that they want and most suits them (Pitafi & Ali, 2023), as well as helping them complete assignments and solve problems more quickly.

On the other hand, several factors that cause the low influence of digital information literacy on learning outcomes are low student initiative and participation in discussions (Giovanni & Komariah, 2019, Chang et al., 2020). This was also found by researchers in the learning process in the classroom. Apart from that, digital information literacy is also influenced by students' skills in accessing information. Generally, students access sources that come from Google, and do not use more specific academic databases such as *Google Scholar*, *Publish or Perish*, or *AI* such as *Chat-GPT*, *Perplexity*, etc. Where through academic sites or websites, they can obtain data that is more relevant, valid and reliable. Students are also suspected of not having mastered effective and efficient information search strategies (Weber et al., 2018), for example by using advanced search options, effective keywords and so on. These shortcomings have implications for weak abilities in managing data (Armata et al., 2003) and can cause confusion,

frustration and loss of motivation (Becker, 2018).

Therefore, guidance and monitoring of teachers or lecturers during the learning process is very important. Even though digital penetration in learning has become a part of everyday life, it does not guarantee that digital information literacy skills will also increase rapidly. Students need to be guided more intensively and given adequate training on how to manage digital-based information in order to improve their performance and learning outcomes positively and significantly.

CONCLUSION

The influence of digitalization on the world of education is inevitable. Therefore, students and teachers must adapt faster in order to make optimal use of technology and digital. Digital information literacy skills are one of the fundamental skills that students really need in the current era of artificial intelligence. Therefore, knowledge and empirical studies regarding this ability are very much needed. The analysis show that digital information literacy has a fairly strong relationship with learning outcomes. Furthermore, regression analysis reveals that there is a positive and significant influence of digital information literacy on learning outcomes. Increasing digital information literacy skills will improve learning outcomes. However, researchers suspect that there are several moderate variables that mediate the influence of digital information literacy on learning outcomes. Therefore, moderating variables such as motivation, involvement, cooperation and metacognition can be researched further to reveal further data, so that a more complete regression model can be produced. Apart from that, the sample limitations in this research are also an important note, and it is hoped that in the future research can be carried out involving a larger sample size, so that more valid and reliable data is obtained.

REFERENCES

Adhikari, J., Scogings, C., Mathrani, A., & Sofat, I. (2017). Evolving digital divides in information literacy and learning outcomes: A BYOD journey in a secondary school. *The International Journal of Information and Learning Technology*, *34*(4), 290-306. https://doi.org/10.1108/IJILT-04-2017-0022.

Andriani, D. N., & Wirawan, Y. R. (2022). Pengaruh Literasi Digital Terhadap Hasil Belajar Mahasiswa Gen-Z Di Masa Pandemi Covid-19. In *SEMINAR NASIONAL SOSIAL, SAINS, PENDIDIKAN, HUMANIORA (SENASSDRA)* (Vol. 1, No. 1, pp. 87-96). prosiding.unipma.ac.id/index.php/SENASSDRA/article/download/2310/1928.

Arima, M., Amaliyah, N., Abustang, P., & Alam, S. (2022). PENGARUH LITERASI DIGITAL TERHADAP HASIL BELAJAR SISWA SEKOLAH DASAR KOTA MAKASSAR: BAHASA INDONESIA DAN BAHASA INGGRIS. *Pendas Mahakam : Jurnal Pendidikan Dan Pembelajaran Sekolah Dasar*, *6*(2), 105-110. https://doi.org/10.24903/pm.v6i2.818

Becker, B. W. (2018). Information literacy in the digital age: Myths and principles of digital literacy. *School of Information Student Research Journal*, *7*(2), 2. https://doi.org/10.31979/2575-2499.070202

Chang, N., Wang, Z., & Hsu, S. H. (2020). A comparison of the learning outcomes for a PBL-based information literacy course in three different innovative teaching environments. *Libri*, *70*(3), 213-225. 10.1515/libri-2018-0132

Demir, K., & Akpinar, E. (2018). The Effect of Mobile Learning Applications on Students' Academic Achievement and Attitudes toward Mobile Learning. *Malaysian Online Journal of Educational Technology*, *6*(2), 48-59. https://www.learntechlib.org/p/188656/.

Giovanni, F., & Komariah, N. (2019). Hubungan antara literasi digital dengan prestasi belajar siswa SMA Negeri 6 Kota Bogor. *LIBRARIA: Jurnal Perpustakaan*, *7*(1), 147-162. https://www.learntechlib.org/p/188656/.

Hinze, A., Vanderschantz, N., Timpany, C. *et al.* A Study of Mobile App Use for Teaching and Research in Higher Education. *Tech Know Learn* **28**, 1271–1299 (2023). https://doi.org/10.1007/s10758-022-09599-6

Kajin, S. (2018). engaruh Pembelajaran Berbasis Literasi Digital Terhadap Motivasi Dan Hasil Belajar Kognitif di MTs N Mojosari dan MTs N Sooko Mojokerto. *PROGRESSA: Journal of Islamic Religious Instruction*, *2*(1), 133–142. https://doi.org/10.32616/pgr.v2.1.119.133-142

Pitafi, A. H., & Ali, A. (2023). An empirical investigation on actual usage of educational app: Based on quality dimensions and mobile self-efficacy. *Heliyon*. 10.1016/j.heliyon.2023.e19284

Rahman, A. M., Alviawati, E., Anggriani, P., Aristin, N. F., Setiawan, F. A., & Simbolon, D. M. (2022). Pengaruh Kemampuan Literasi Informasi Terhadap Hasil Belajar Peserta Didik Kelas X SMAN 10 Banjarmasin. *geoedusains: Jurnal Pendidikan Geografi*, *3*(1), 46-58.

Serenko, A., Detlor, B., Julien, H., & Booker, L. D. (2012). A model of student learning outcomes of information literacy instruction in a business school. *Journal of the American Society for Information Science and Technology*, *63*(4), 671-686.

Soraya, S. M., Kurjono, K., & Purnamasari, I. (2023). Pengaruh Literasi Digital Siswa Terhadap Hasil Belajar Siswa Dengan Motivasi Belajar sebagai Variabel Moderator. *Jurnal Educatio FKIP UNMA*, *9*(2), 681-687. https://doi.org/10.31949/educatio.v9i2.4537

Weber, H., Hillmert, S., & Rott, K. J. (2018). Can digital information literacy among

undergraduates be improved? Evidence from an experimental study. *Teaching in Higher Education*, *23*(8), 909-926. 10.1080/13562517.2018.1449740.

Yusuf, Y. (2019). Peran Literasi Digital dalam Meningkatkan Hasil Belajar Peserta Didik Matematik IPA Kelas X di Madrasah Aliyah Negeri Palopo. Skripsi. Tidak diterbitkan. IAIN Palopo, http://repository.iainpalopo.ac.id/id/eprint/3285.