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### Digital Web Literacy Improves Writing Skills

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#### Abstract

The purpose of this study is digital web literacy in improving the ability to write papers in students. The experimental research was carried out in the 2020/2022 academic year at Ibn Khaldun University Bogor, Indonesia, a data collection instrument with observations, questionnaires, and tests. Data analysis by taking measurements before and after participating in activities, processing results with statistics, data analysis, and conclusions. The findings of new students learn to search for data on the digital web with the provision of a reputable journal web address, students are not familiar with software for writing citations such as Mendeley, students are not used to writing academically, and students think writing is a difficult activity. The results of the trial and olah data showed that the sig value. (2-tailed) 0.000 less than ( $<$ ) 0.05, it can be concluded that the experimental class that uses digital web literacy teaching materials is better than the control class that uses conventional teaching materials.

**Keywords:** digital literacy, writing, term papers

#### Introduction

(Aisiah & Firza, 2019) that the obstacles to student academic writing include finding research ideas, looking for literature and empirical data in the field as well as technical obstacles related to writing aspects related to structure (systematics) and rules for the use of scientific language and standard Indonesian. (Altinmakas & Bayyurt, 2019) student writing is influenced by a variety of interrelated educational and contextual factors. (White & King, 2020) the importance of guidance and academic communication skills of doctoral students. (Cilliers, 2012) academic writing activities are widely used in report writing. (Alkhuzaee et al., 2019) say that students from various majors at the university need writing practice and courses. This means that students experience problems at the time of writing, writing cannot be done instantly but rather in a sustainable way and guidance.

(Dugartsyrenova, 2020) explaining with the range of technology students find it helpful in writing activities compared to printed materials. (Pop, 2015) information and communication technology can improve language teaching and learning and can help complete student assignments. (Hung et al., 2018) *digital games* to promote language learning and literacy. (Sarica & Usluel, 2016), *digital storytelling* can improve students' writing skills. (Machili et al., 2019) The use of video in student writing assignments. (Rahman & Tresnawati, 2016), educational games in learning can increase understanding in teaching animal names in three languages, Indonesian, English, and Arabic. (Collier et al., 2013) technology is a powerful tool for improving writing skills and writing teaching in various fields of writing. (Wang et al., 2020) designed an *AWE* system that supports student activities to succeed in revising essays. (Sarica & Usluel, 2016) conducting storytelling activities with digital tools and the results create a significant difference in students' writing skills. (Llema & Vilela-Malabanan, 2019) using *the MLEWS* app on mobile devices for learning the ability to read and write languages that can be

used without an internet network. (Gural & Shulgina, 2015) *Web Quest* technology is used to develop foreign language discourse. Media Wiki as learning to read and write, (Mak & Coniam, 2008). Using *the "Toolkit"* in helping students scientifically write, (Dirrigl & Noe, 2019). Participatory games in developing skills, interest in learning and student careers, (Rahimi & Kim, 2019). Technological literacy can improve the quality of teamwork, learning outcomes, and improve student performance, (Blanco et al., 2017). Multimedia in learning has advantages such as accommodating learning styles, students can choose material, and speed in learning, (Darwin et al., 2021). Understanding digital literacy has an impact on improving the economy, (Murtadho et al., 2022). This means that technology has an important role in writing learning, what must be highlighted is the proficiency in using digital technology such as digital web literacy in student academic writing activities so that there are no mistakes and produce good academic work. This research originated from the problems described in the previous section, namely student constraints in writing and the role of technology in helping to write such as social media, *Web Quests, toolkits, partisopative gam, MLERWS, digital games, and digital storytelling*. The purpose of this study is digital web literacy in improving the ability to write papers. We consider there to be a correlation between digital web literacy skills and paper writing skills.

## Method

Digital web literacy experimental research to improve the ability to write papers was carried out in the 2020/2022 academic year at Ibn Khaldun University Bogor, Indonesia, a data collection instrument with observations, questionnaires, and tests. Data analysis by taking measurements before and after participating in activities, processing results with statistics, data analysis, and conclusions.

## Result and Discussion

### Result

This experiment was conducted to see how effectively the teaching materials used in learning activities can improve students' writing skills. The following are the scores of experimental classes using digital web literacy in writing learning as well as control class scores without using digital web literacy.

**Table 1** The value of the experimental class

No	Name	Value	
		Pretes	Postes
1	Adisty yolanda	67	69
2	Annisa nur faujiah	70	75
3	Azizah nurrohmah	58	60
4	Azzahra miftahul amalia	62	72
5	Dina fauziyyah qoyyimah ajhari	67	69
6	Dita nurpajarini	71	75
7	Ellyyanti noor permatasari	50	69
8	Erisha ika candra swari	73	77
9	Gina nurkamillah	64	69
10	Kania edawafa basmet	59	68
11	Khairun nazwa	67	73
12	Laelatul fitrian fauzia	63	73
13	Masasi manjalani	56	68
14	Muna rahayu hidayat	68	73
15	Mutiara muslimah	60	61
16	Nabila humaedatul zahra	65	68
17	Naura shabirrania darmawan	68	73
18	Nazhiifa asyila wardah	57	70
19	Nendennia silpiana	65	66
20	Neng syifa	52	58
21	Pani padilah	54	69
22	Rahma kharunnisa	60	63
23	Rahmah nasution	63	70
24	Shafa hanifah	62	69
25	Shahida bilqis	69	73
26	Siti artanti mulyasari	66	69
27	Sofwatul qurbah kholidah	76	76
28	Suci martiningtyas	73	76
29	Syahnaz fitri ramadani	74	74
30	Syarifah najwa auliya	70	74
31	Synthia permata hati	74	76
32	Tri rahayu puiji winasih	73	76
33	Wafa aulia rahmah	68	68

The experimental class from the observation results there are several activities that students think are very new things such as searching for data on the digital web with the provision of a fused journal web address, both students are not familiar with software in citing writing such as Mendeley, the three students are not used to writing academically and nonacademically, the four students think writing is a difficult activity.

**Table 2** Control class values

No	Nam E	Value	
		Pretes	Postes
1	Ayu Indriyani	28	68
2	Muhammad Dizki Alfaizal Muktar	28	28
3	Masasi Manjalani	56	56
4	Haryati nazwan	66	66
5	Wafa Aulia Rahmah	68	68
6	Siti nurjanah	43	43
7	Haya Najma Husniyyah	41	41
8	Saskia Sabrina	58	58
9	Salwa Nurpadia	58	28
10	Siti Salmah	64	64
11	Muna Rahayu Hidayat	68	68
12	Pani Padilah	54	54
13	Tiara Difa Madaniah	47	47
14	Mufqi Atqiya	66	66
15	Sulam janah	59	66
16	Sharah fadillah	66	66
17	Khairun Nisa	59	59
18	Maudi wulandari	64	66
19	Asa afifatun nazma	67	67
20	Ahmad buhaeri kalbu	58	58
21	Humaira Aisyah Siregar	47	47
22	Meta Salisna Rahmadita	63	63
23	Anis Sri Sulistiani	33	33
24	Tasya Nuraulia	74	66
25	Shahida Bilqis	67	66
26	Adisty yolananda	62	62
27	azzahra miftahul amalia	62	62
28	Neng Syifa	52	66
29	Azizah Nurrohmah	58	58
30	Gina Nurkamilah	64	64
31	Naura Shabirrania Darmawan	68	66
32	Annisa Nur Faujiah	70	70
33	Erisha Ika Candra Swari	73	66

**a. Description of statistics**

**Table 3** Description of statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Pre test Experiments	33	50.00	76.00	64.9697	6.70580
Experiment test post	33	58.00	77.00	70.2727	4.79109
Pre test Control	33	28.00	74.00	57.9091	12.09691
Control test post	33	28.00	70.00	58.3636	11.84752
Valid N (listwise)	33				

**b. Normality test**

**Table 4** Normality Test

Tests of Normality							
	Class	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistics	Df	Sig.	Statistics	Df	Sig.
Learning Outcomes	Pre test Experiments	.104	33	.200*	.970	33	.474
	Test post Experiments	.166	33	.021	.916	33	.014
	PreTest Control	.200	33	.002	.878	33	.001
	Control test post	.227	33	.000	.779	33	.000
a. Lilliefors Significance Correction							
*. This is a lower bound of the true significance.							

**c. Homogeneity test**

**Table 5** Homogeneity test

Test of Homogeneity of Variance					
		Levene Statistics	df1	df2	Sig.
Learning Outcomes	Based on Mean	14.419	1	64	.000
	Based on Median	5.598	1	64	.021
	Based on Median and with adjusted df	5.598	1	37.264	.023
	Based on trimmed mean	11.757	1	64	.001

**d. Test Wilcoxon Signed Ranks test**

**Table 6** Wilcoxon Signed Ranks Test

Ranks				
		N	Mean Rank	Sum of Ranks
post score of experimental test - pre test value of experiment	Negative Ranks	0 <sup>a</sup>	.00	.00
	Positive Ranks	30 <sup>b</sup>	15.50	465.00
	Ties	3 <sup>c</sup>		
	Total	33		
control test heading value - control test pre-value	Negative Ranks	5 <sup>d</sup>	4.40	22.00
	Positive Ranks	4 <sup>e</sup>	5.75	23.00
	Ties	24 <sup>f</sup>		
	Total	33		
a. test post scores < experimental pre-test scores				
b. experimental test post scores > experimental pre-test scores				
c. experimental test post value = experimental pre test value				
d. control test post scores < control pre test scores				
e. control test post value > control pre test score				
f. control test post value = control test pre value				

**Table 7** Statistical tests

Test Statistics <sup>b</sup>		
	post score of experimental tests -pretest value of experiment	control test heading value -control test pre-value
Z	-4.789 <sup>a</sup>	-.059 <sup>a</sup>
Asymp. Sig. (2-tailed)	.000	.953
a. Based on negative ranks.		
b. Wilcoxon Signed Ranks Test		

**Discussion**

Experiments carried out to answer the problems faced by students are explained (Aisiah & Firza, 2019) obstacles to student writing; finding research ideas, looking for literature and empirical data in the field as well as aspects of writing structures (systematics) and rules for the use of scientific language. (White & King, 2020) the importance of student guidance and academic communication skills. (Cilliers, 2012) academic writing activities are widely used in report writing. (Alkhuzae et al., 2019) students need writing practice and courses.

The experiment we do is to provide digital web literacy practices in writing papers, there is also a treatment that we provide, namely guiding students to find literature from various reliable sources, how to paraphrase, quote, express ideas in the form of academic writing, bibliography with the Mendeley application and share the results of writings on social media.

The experiments carried out are in line with several previous studies such as (Dugartsyrenova, 2020) the range of technology students feel helped in writing activities compared to printed materials. (Pop, 2015) information and communication technology can improve language teaching and learning and can help complete student assignments. (Collier et al., 2013) technology is a powerful tool for improving writing skills and writing teaching in various fields of writing. (Wang et al., 2020) designed an AWE system that supports student activities to succeed in revising essays. (Sarica & Usluel, 2016) storytelling with digital tools and the results create a significant difference in students' writing skills. (Sarica & Usluel, 2016), *digital storytelling improves* students' writing skills. (Machili et al., 2019) The use of video in student writing assignments. Technological literacy can improve the quality of teamwork, learning outcomes, and improve student performance, (Blanco et al., 2017). This means that various previous studies explain the role of technology in student writing learning which is claimed to have more value compared to conventional learning.

(Hung et al., 2018) *digital games* to promote language learning and literacy. (Rahman & Tresnawati, 2016), educational games can increase understanding in teaching animal names in three languages, Indonesian, English, and Arabic. (Llema & Vilela-Malabanan, 2019) *MLERWS* application on mobile devices for learning the ability to read and write languages that can be used without an internet network. (Gural & Shulgina, 2015) *Web-Quest* technology to develop foreign language discourse. Media Wiki as learning to read and write, (Mak & Coniam, 2008). "*Toolkit*" in helping students scientific writing, (Dirrigl & Noe, 2019). *Participatory games* in developing skills, interest in learning and student careers, (Rahimi & Kim, 2019). Various software used in learning such as *games, web quests, MLERWS* applications, and Wikis are claimed to help writing learning.

The results of theanalysts are that we see that the use of technology and various software is only limited to explaining software such as *games, web quests, MLERWS* applications, Wikis, and the use of technology in writing learning, whereas in this experiment emphasizes the use of digital web literacy teaching materials in improving writing skills. The ability to write this we consider important because the web is developing very fast and many webs are unaccountable for their truth. The results of the experiments we conducted are seen in the following table:

**a. Normality test**

A normality test is performed to see whether the residual value is normally distributed or not. Dara took the decision "if the significance value is >0.05 then the residual value is normally distributed", "if the significance value is <0.05 then the residual value is not normally distributed".

**Table 8** Normality Test

Tests of Normality							
	Class	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistics	Df	Sig.	Statistics	Df	Sig.
Learning Outcomes	Pre test Experiments	.104	33	.200*	.970	33	.474
	Test post Experiments	.166	33	.021	.916	33	.014
	Pre Test Control	.200	33	.002	.878	33	.001
	Control test post	.227	33	.000	.779	33	.000
a. Lilliefors Significance Correction							
*. This is a lower bound of the true significance.							

The results of the statistical calculation of the normlity test with Kolmogorov-Smirnov explained that the significance value of 0.000 < 0.005 means that the data is not normally distributed.

**b. Homogeneity test**

After the normality test, it is continued with the homogeneity test. A homogeneity test is a test that is carried out to determine whether two or more groups of sample data come from populations that have the same or homogeneous variants. This test is a requirement before performing other tests. This test was carried out to ensure that the data group came from a population that had the same or homogeneous variants. The decision-making basis for the

homogeneity test is; "jika significance value > 0.05 then homogeneous data distribution", and "jika significance value < 0.05 then inhomogeneous data distribution".

**Table 9** Homogeneity test

Test of Homogeneity of Variance					
		Levene Statistics	df1	df2	Sig.
Learning Outcomes	Based on Mean	14.419	1	64	.000
	Based on Median	5.598	1	64	.021
	Based on Median and with adjusted df	5.598	1	37.264	.023
	Based on trimmed mean	11.757	1	64	.001

The data of the homogeneity test results with a significant value of 0.000 less than 0.05, then it can be concluded that the data is not distributed homogeneously, because the data is abnormal and inhomogeneous, the next test using the Wilcoxon non-parametric test.

**c. Test Wilcoxon Signed Ranks Test**

**Table 10** Wilcoxon Test Wilcoxon Signed Ranks test

Ranks				
		N	Mean Rank	Sum of Ranks
post score of experimental test - pre test value of experiment	Negative Ranks	0 <sup>a</sup>	.00	.00
	Positive Ranks	30 <sup>b</sup>	15.50	465.00
	Ties	3 <sup>c</sup>		
	Total	33		
control test heading value - control test pre-value	Negative Ranks	5 <sup>d</sup>	4.40	22.00
	Positive Ranks	4 <sup>e</sup>	5.75	23.00
	Ties	24 <sup>f</sup>		
	Total	33		
a. test post scores < experimental pre-test scores				
b. experimental test post scores > experimental pre-test scores				
c. experimental test post value = experimental pre test value				
d. control test post scores < control pre test scores				
e. control test post value > control pre test score				
f. control test post value = control test pre value				

The table above explains that the negative rank in the experimental class did not decrease from the pre-test to the test post, the positive rank increased between the pre-test to the test post by 15.50 points, the same value between the pre-test and the test post by 3 points, the conclusion that the experimental class had increased with a mean rank of 15.50 points and a total rank of 465.00 points.

The negative rank control class experienced a decrease between the pre-test to the test post by 5 points, the positive rank between the pre-test and the test post increased by 4 points, the number of scores was the same by 24 points, the conclusion was that the positive rank increased with a mean rank point of 5.75 and a decrease between the negative rank and the 4.40 points. The total negative rank is 22.00 points and the total positive rank is 23.00 points.

**Table 11** Statistical tests

Test Statistics <sup>b</sup>		
	post score of experimental test - pre test value of experiment	control test heading value - control test pre-value
Z	-4,789 <sup>a</sup>	-.059 <sup>a</sup>
Asymp. Sig. (2-tailed)	.000	.953
a. Based on negative ranks.		
b. Wilcoxon Signed Ranks Test		

Table 11 explains that *the sig rate. (2-tailed)*  $0,000 < 0.05$ , then there is significant data between the experimental class and the control class or the class that uses digital web literacy teaching materials is better than the control class that uses conventional materials.

This means that digital web literacy teaching materials have an influence in improving students' paper writing ability, in line with (Blevins, 2018) saying the understanding of *Augmented Reality* (AR) devices in supporting students' ability to write. (Polizzi, 2020) the ability to evaluate online content involves not only reflection on the nature and origin of information, contextual knowledge and the use of various sources, but also functional and critical digital skills and knowledge. (Martin-Beltrán et al., 2017) teaching uses digital texts to support language and literacy development. (Bradbury, 2014) using technology in the writing classroom and to develop "critical technological literacy. Internet skills improve comprehension and learning outcomes, (Greene et al., 2014) Students can generally use foreign technology easily in their learning to create useful writing. (Ng, 2012). Showed high self-confidence in their digital literacy significantly (Porat et al., 2018).

The ability to use digital tools (digital literacy) is important in supporting student learning success as evidenced by various studies conducted previously, this is in line with the results of this study that digital web literacy skills are proven to improve student writing learning outcomes

### Conclusion

This research helps solve the problems that students are facing when writing, including the obstacles of finding ideas, looking for literature, language aspects, and students need practice and writing courses. In this experiment we gave treatment such as looking for reading material, language aspects (paraphrasing, citations, and introduction to Mendeley's device), and mentoring when writing. The results of the experiment using statistical calculations of the normality test, homogeneity test, and Wilcoxon test showed that there was a significant difference between the experimental class and the control class with a *sig value (2tailed)* of 0.000 less than ( $<$ ) 0.05. Furthermore, this teaching material can be developed and tested by teachers at the middle and high school levels.

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