



The Effectiveness of Rubeda (Regional Learning Space) 3T Multimedia Application in Improving Digital Skills of the Warmon Kokoda Village Community

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Digital literacy is one of the indicators of the progress of a nation or country in the era of revolution 5.0, this is made by the Indonesian government as a framework called "digital capability" in this case the Ministry of Communication and Information Technology since 2017 with various programmes targeting four pillars or main competencies, namely: Digital Skill, Digital Culture, Digital Ethics, and Digital Safety, but Indonesia's digital literacy percentage in 2023 is still low with a score of 62%, the lowest in ASEAN countries. This is caused by various factors, one of which is the uneven development of internet access devices, especially eastern Indonesia which is an area without internet access or called the 3T area (disadvantaged, frontier and outermost). The type of research used is a combination of Borg & Gall's Research and Development (R&D) and Multimedia

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Development Life Cycle (MDLC). This is the purpose of the research to improve digital literacy (digital skills) through the development of the RUBEDA 3T multimedia application which can be accessed using an intranet network (without the internet) which is effective to use. The type of research used is a combination adaptation between R&D (Borg & Gall) with MDLC (Multimedia Development Life Cycle). Measuring the effectiveness of the RUBEDA 3T Application using Paired sample t test analysis then continued the N-gain test. So that the results of the effectiveness value obtained a percentage value of 79.81% with an effective category, showing an increase.

Keywords: RUBEDA 3T; digital literacy; effectiveness.

1. INTRODUCTION

The Republic of Indonesia is the fourth most populous country after China, India, and the United States, with a population of 278 million people, even recorded to be the fourth active internet user in 2023 with a percentage of 70% of the total population of Indonesia [1]. Internet access carried out by Indonesians via smartphone or mobile phone devices continues to increase every year, this provides experience and skills in accessing information anywhere, which has a positive influence and is inseparable from negative influences on various sectors of people's lives, including education, health, economy and various other sectors [2].

This population also makes Indonesia one of the largest internet users in the world, but Indonesia only has a digital literacy capability of 62%, this percentage is the lowest value compared to countries in ASEAN (Malaysia, Singapore, Thailand, Philippines, Brunei Darussalam, Vietnam, Laos, Myanmar, Cambodia and Timor Leste) which on average reaches a percentage of 70% [3] This is influenced by the digital divide that occurs because internet development is still centred on the island of Java, or western Indonesia. Meanwhile, eastern Indonesia is lagging behind. This statement is supported by Presidential Regulation of the Republic of Indonesia Number 63 of 2020 concerning the Determination of Underdeveloped Regions for 2020-2024 at the point of listing provincial underdeveloped areas, the Eastern region still dominates, such as West Nusa Tenggara (1 Regency), East Nusa Tenggara (13 Regencies), Central Sulawesi (3 Regencies), Maluku (6 Regencies), North Maluku (2 Regencies), West Papua (8 Regencies), and Papua (22 Regencies).

Overcoming the digital literacy gap, the government, in this case KOMINFO (Ministry of Communication and Information) Indonesia, designed a programme called Indonesia Makin

cakep Digital which focuses on four aspects or pillars, namely: Digital Skill, Digital Culture, Digital Ethics, and Digital Safety [4]. The four pillars of digital literacy that researchers focus on are digital skills and digital culture because the development of telecommunications media and information transmission is accelerating and cannot be controlled by the government or society itself, so it is necessary to provide knowledge, abilities and skills in digital skills and digital culture so as not to harm oneself, others, the nation and the state [5].

Digital literacy is the basis of digital literacy competence by emphasising the skills of the community to recognise and operate hardware and software according to their needs, illustrated in the indicators, (1) Basic knowledge of the digital landscape of the internet and cyberspace, (2) Basic knowledge of information search engines, how to use and select data. (3) Basic knowledge of conversation and social media applications. Meanwhile, digital culture aims to improve the ability to interact, behave, think and communicate as humans in a society based on Pancasila and Bhinneka Tunggal Ika, as outlined in the following competency indicators: (1) Basic knowledge of the values of Pancasila and Bhinneka Tunggal Ika as the basis for digital skills in the life of culture, nation and state, (2) digitalisation of culture through the use of ICT, (3) Basic knowledge that encourages the behaviour of loving domestic products, and (4) Digital Rights [6]. Ruang Belajar Daerah (RUBEDA) is a multimedia application developed to improve digital literacy in areas that do not have internet access, otherwise known as 3T areas (underdeveloped, border, and outermost). The app is designed to be accessed through an intranet network and has been proven effective in improving digital skills. Through a combination of Research and Development (R&D) and Multimedia Development Life Cycle (MDLC) methods, the RUBEDA app achieved an effectiveness rate of 79.81% in improving digital literacy in the Warmon Kokoda community. The

results of this study have significant implications in improving digital skills in Indonesia, especially in 3T areas, and can contribute to improving digital literacy scores at the national level.

Based on the results of preliminary research through direct and open interviews with the head of Warmon village Mr Samsudin Namugur and the Principal of SD Labschool Muhammadiyah Oki Nafiri, S.Pd. on 19 January 2023. Revealed that "internet access is not yet available, only cellular networks (telephone) and even then must be in a certain location to be able to use the cellular service, the community is less familiar with technological media, especially ICT that has developed, the implementation of education at the kindergarten, elementary and junior high

school levels, students and teachers have never used ICT-based learning media (video-based media) is still done conventionally. The general public is closed off from developing information such as information on farming, gardening, development, health, and other educational news.

2. METHODOLOGY

The type of research used is a combination of Borg & Gall's Research and Development (R&D) and Multimedia Development Life Cycle (MDLC) [7] which is adapted, resulting in more effective research steps as illustrated in the following Fig. 1.



Fig. 1. Illustration of the Combination of the Development Research Model (Borg & Gall) with the adapted MDLC (Firman, 2023)

However, in this study, it was carried out until the preliminary field testing step. The research sample was taken randomly from the Warmon Kokoda village community in Mayamuk District as many as 30 people of various ages and walks of life (profession), the data generated is quantitative data which is primary data in the form of results before (pretest) and after (posttest) using the RUBEDA 3T Multimedia Application. The pretest results aim to determine the ability and initial knowledge of the community about digital literacy (Digital Skill) before being recommended to use the RUBEDA 3T application, while the posttest results aim to determine the increase in the ability and knowledge of the community about digital literacy (Digital Skill) after using the RUBEDA 3T application. The community test results were analysed by calculating the score obtained with the condition that if "correct" = 1 and "wrong" = 0.

The analysis used by researchers in measuring the effectiveness of the RUBEDA (Regional Learning Space) 3T Multimedia Application is statistical analysis with N-Gain Score (Normalised Gain Score) by first conducting a Paired sample t test with the following criteria:

H0: $\beta_1 < 0$: Indicates there is effectiveness from the use of multimedia applications RUBEDA 3T understanding and digital literacy skills.

H1: $\beta_1 > 0$: Indicates there is no effectiveness from the use of the RUBEDA 3T multimedia application understanding and digital literacy skills.

With hypothesis acceptance criteria:

1. If $t_{count} > t_{table}$ and $sig < 0.05$, then H0 is accepted and H1 is rejected
2. If $t_{count} > t_{table}$ and $sig < 0.05$, then H0 is rejected and H1 is accepted
3. Significant level = 5% (0.05)
4. Degree of freedom (df) = n-2

While the Effectiveness Test with N-Gain Score is carried out by calculating the difference between the pretest value (the test before being given treatment using the RUBEDA 3T application) and the posttest value (the test after being given treatment using the RUBEDA 3T application).

The formula for calculating N-Gain Score

$$N\text{-Gain} = \frac{\text{PostTest Score} - \text{PreTest Score}}{\text{Ideal Score} - \text{PreTest Score}}$$

The ideal score is the maximum (highest) score obtained [8].

Table 1. Effectiveness categories

No	Interval	Classification
1	> 76	Efficient
2	50-75	Fairly efficient
3	40-55	Less efficient
4	< 40	Ineffective

Source: Sahid Raharjo, 2019

According to the gain score criterion, the effectiveness of the RUBEDA 3T Multimedia Application is determined by the community's skill and knowledge, which should have a score or value of over 50, meeting the fairly effective criteria.

3. RESULTS AND DISCUSSION

The four indicators of digital skills are fundamental knowledge and abilities that individuals must possess in order to stay up to date with technological advancements in the 5.0 era. These indicators contribute to increasing Indonesia's digital literacy score. Table 2 provides an overview of the four pillars of digital literacy.

Based on the aforementioned signs, the pretest and posttest instruments were developed, comprising of four questions. The first question inquired whether the individual has previously utilized any search engine media, application, or platform. b) Have you ever utilized a communication application or platform? c) Have you ever transmitted visual documents, files, and movies via media, applications, or platforms? Furthermore, have you ever autonomously submitted videos or content on a video sharing platform? The outcomes of the pretest and posttest for the digital skills community are as follows Table 3.

From the table of pretest analysis results, it is obtained information that the Warmon Kokoda Village community has the ability and knowledge of digital skills in the high category 6, medium 0 (none), and low 24 people. So it can be concluded that the digital literacy skills of the Kokoda Village community are still in the "low" category with an average score of 0.8, a percentage of 20%. After the approach using the RUBEDA 3T application, the ability and knowledge of the community increased

Table 2. Areas and indicators of digital literacy competence

Digital Skills	Digital Culture	Digital Ethics	Digital Safety
Fundamental Understanding of Landscape The digital landscape refers to the virtual environment created by the internet and cyberspace.	Basic knowledge of the values of Pancasila and <i>Bhineka Tunggal Ika</i> as the foundation of digital skills in life culture, nation, and state	Nettiquette	Basic knowledge about protection features hardware
Basic Knowledge Machine Search Engine, how to use and data sorting	Digitalisation Culture through utilisation of ICT	Knowledge about information that contains hoaxes, hate speech hate speech, pornography, bullying and negative content other	Basic knowledge about digital identity protection digital identity and personal data on digital platforms Digital
Fundamental Understanding of Landscape The digital landscape refers to the virtual environment created by the internet and cyberspace.	Knowledge base that promotes the adoption of a positive attitude towards domestic products and other constructive activities.	Interact, participate, and collaborate in digital places while adhering to the principles of digital ethics and relevant regulations.	Compendium of information regarding digital fraud
Essential understanding of apps' digital wallet, local marketplace, transaction platform, and digital transactions, Electronic entitlements	Digital Rights	Fundamental understanding of engaging and conducting transactions electronically within the digital realm, in compliance with relevant legislation.	Essential understanding of digital footprints in the media, specifically related to downloading and uploading.
			Minor safety (catfishing)

dramatically to 23 people in the high category, 6 in the medium category, and 1 in the low category, with an average score of 3.14 percentage 78.33% high category [9].

To be able to know the increase in the ability and knowledge of the Warmon Kokoda Village community, it was obtained by using the normalised gain (N-gain) formula. Before testing the N-gain, it is necessary to test the hypothesis using the Paired sample t test using SPSS with the following criteria:

H0: $\beta_1 < 0$: Indicates that there is an effectiveness of using the RUBEDA 3T

multimedia application in understanding and digital literacy skills.

H1: $\beta_1 > 0$: Indicates there is no effectiveness from the use of the RUBEDA 3T multimedia application understanding and digital literacy skills.

After the analysis using the Paired Sample T test, the sig talled value is 0.000 <0.05, it can be concluded that H1 is rejected and H0 is accepted, because it shows that there is effectiveness from the use of the RUBEDA 3T multimedia application understanding and digital literacy skills.

Paired Samples Test

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 Pretest - Posttest	-2.33333	1.39786	.25521	-2.85530	-1.81136	-9.143	29	.000

Table 3. Results of pretest and posttest scores

No	Name	Pretest Result	Category	Posttest Result	Category
1	MR	0	Low	75	High
2	BU	0	Low	75	High
3	NT	0	Low	100	High
4	NY	0	Low	100	High
5	BL	0	Low	100	High
6	MM	0	Low	75	High
7	RM	0	Low	50	Fair
8	FR	0	Low	75	High
9	RH	0	Low	25	Low
10	GLH	0	Low	75	High
11	YST	0	Low	75	High
12	HS	0	Low	75	High
13	MT	100	High	100	High
14	SYM	0	Low	75	High
15	RST	0	Low	100	High
16	MK	0	Low	100	High
17	IDR	100	High	100	High
18	SR	0	Low	75	High
19	BDN	0	Low	100	High
20	BAM	100	High	100	High
21	ZL	0	Low	75	High
22	JJ	0	Low	50	Fair
23	BTH	100	High	100	High
24	LU	0	Low	50	Fair
25	RA	100	High	100	High
26	YHD	0	Low	50	Fair
27	SHD	0	Low	50	Fair
28	KSR	0	Low	50	Fair
29	MH	100	High	100	High
30	MKJ	0	Low	75	High

Descriptives

		Statistic	Std. Error	
Ngain_Score	Mean	.7981	.04165	
	95% Confidence Interval for Mean	Lower Bound	.7123	
		Upper Bound	.8839	
	5% Trimmed Mean	.8141		
	Median	.7500		
	Variance	.045		
	Std. Deviation	.21236		
	Minimum	.25		
	Maximum	1.00		
	Range	.75		
	Interquartile Range	.25		
	Skewness	-.820	.456	
	Kurtosis	.109	.887	

Fig. 2. N-Gain score analysis results

Table 4. N-Gain analysis results

No	Name	Pretest Result	Posttest Result	N-Gain Score	Category
1	MR	0	75	0.75	High
2	BU	0	75	0.75	High
3	NT	0	100	0.75	High
4	NY	0	100	1.00	High
5	BL	0	100	1.00	High
6	MM	0	75	1.00	High
7	RM	0	50	0.75	Fair
8	FR	0	75	0.50	High
9	RH	0	25	0.75	Low
10	GLH	0	75	0.25	High
11	YST	0	75	0.75	High
12	HS	0	75	0.75	High
13	MT	100	100	0	High
14	SYM	0	75	1.00	High
15	RST	0	100	0.75	High
16	MK	0	100	1.00	High
17	IDR	100	100	0	High
18	SR	0	75	1.00	High
19	BDN	0	100	0.75	High
20	BAM	100	100	0	High
21	ZL	0	75	1.00	High
22	JJ	0	50	0.75	Fair
23	BTH	100	100	0	High
24	LU	0	50	1.00	Fair
25	RA	100	100	0.50	High
26	YHD	0	50	1.00	Fair
27	SHD	0	50	0.50	Fair
28	KSR	0	50	0.50	Fair
29	MH	100	100	0	High
30	MKJ	0	75	1.00	High

After the t-test or hypothesis test is carried out, the N-gain test step is continued. The N-gain score obtained was then analysed using criteria adapted by Sahid (Raharjo, 2019). The results of the N-Gain analysis are presented in Table 4.

From the table and figure of the analysis results using the N-Gain Score, a percentage value of 79.81% is obtained in the effective category, so it can be concluded that the RUBEDA 3T application is effectively used as a digital literacy learning media, especially on the pillars of digital literacy skills (Fig. 2).

4. CONCLUSION

Based on the results of research and discussion, it can be concluded that the RUBEDA 3T multimedia application is effective as a learning media for digital literacy skills, because it can improve the abilities and skills of the Warmonn Kokoda community based on tests using the N-

Gain Score with a value of 79.81% effective category.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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