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Subject Area	Social Science
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Total Authors	04
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Author Names	Arsad Bahri
Subject Area	Social Science
Article Category	Research Paper
Abstract	Digital literacy is a skill that must be possessed by students in the era of the industrial revolution 4.0. But the equalization of education is one of the factors in empowering digital literacy, especially in areas that are newly out of underdeveloped and remote area. This study was concurrent triangulation research that combines qualitative and quantitative research. This study aimed to find out the initial profile of digital literacy skills of students and teachers in areas that are newly out of underdeveloped and remote area (urban and rural areas) located in Jeneponto District, Indonesia, involving 450 students and 100 teachers. Data collection using questionnaires, in-depth interviews and documentation (triangula-tion). Data were analyzed descriptively and inferentially. The results showed that; a) the level of digital literacy skill of students in the beginner category in 15 schools, 2) the level of digital literacy skill of teachers in the basic category in 15 schools, 3) there was a difference between dif-ferent class levels to the digital literacy skills of students, 4) there was a difference between different genders to the digital literacy skills of stu-dents, and 5) the expectation of students and teachers in urban areas were to develop digital literacy skill that has been owned before, and the hope of rural areas is to do the procurement of technology in learningin schools.
Keywords	

Digital literacy skill, school, classroom, gender, urban and rural

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Students' and Teachers' Digital Literacy Skill: A Comparative Study between Schools, Classes, and Genders in Urban and Rural Areas

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Abstract — Digital literacy is a skill that must be possessed by students in the era of the industrial revolution 4.0. But the equalization of education is one of the factors in empowering digital literacy, especially in areas that are newly out of underdeveloped and remote area. This study was concurrent triangulation research that combines qualitative and quantitative research. This study aimed to find out the initial profile of digital literacy skills of students and teachers in areas that are newly out of underdeveloped and remote area (urban and rural areas) located in Jeneponto District, Indonesia, involving 450 students and 100 teachers. Data collection using questionnaires, in-depth interviews and documentation (triangulation). Data were analyzed descriptively and inferentially. The results showed that; a) the level of digital literacy skill of students in the beginner category in 15 schools, 2) the level of digital literacy skill of teachers in the basic category in 15 schools, 3) there was a difference between different class levels to the digital literacy skills of students, 4) there was a difference between different genders to the digital literacy skills of students, and 5) the expectation of students and teachers in urban areas were to develop digital literacy skill that has been owned before.

Keywords—Digital literacy skill, school, classroom, gender, urban and rural,

Introduction

Education for all and equalization of education is very important, especially in underdeveloped areas in Indonesia. The advancement of education in underdeveloped areas in Indonesia could be said to be very backward due to the lack of equitable distribution of educational services [1].

The equalization of education is not only the same material coverage of each region with certain examinations as standards that must be achieved nationally, but also maximizes teaching in accordance with the goals that have been designed and output contextually by each educational institution evenly in Indonesia. The impact of this imbalance and deviation is what causes the ability and skills of students can not be honed properly, one of which is the digital literacy of students [2].

Digital literacy as knowledge and proficiency to use digital media, communication tools or networks in finding, evaluating, using, making information and utilizing it wisely, intelligently, carefully, precisely and law-abiding [3], [4]. According to UNESCO's rodmap (2015-2010), digital literacy was becoming an important pillar for the future in the world of education [5], [6]. According to Pangrazio [7], digital literacy was able to open opportunities to students in thinking, communicating, and working that affected to their learning success without the limits of place and time. If students in an educational environment have digital literacy skills, then they could utilize those skills to be productive, develop themselves and produce productive work as well [8], [9]. Therefore, awareness of the urgency of digital literacy skills needs to be improved among both students and teachers in decision making during the learning process. But the digital literacy skills of students in Indonesia look still low.

According to PISA 2015, a student is said to have a good level of literacy if he or she is able to analyze, reason, and communicate his knowledge and skills in mathematics, science and reading well. Of course, it is closely related to the condition of the education ecosystem in general and evenly distributed in a sampled region. Research results in Indonesian schools showed that the digital literacy of students is still below the standard of being in the category "Not Good" [10], [11]. In addition, in research conducted by Perdana, Yani, Jumadi & Rosana [12], students in Indonesia were only limited to "knowing" using technological devices, but not in their "implementation". The lack of digital literacy skills of students in Indonesia would have an impact on their learning outcomes [5].

In some literatures also write that in areas that have felt the zone of underdeveloped areas in Indoensia, there are still many students and few teachers who do not understand what is meant by digital literacy both in terms of understanding and implementation [10]. The learning process in underdeveloped areas is only limited to learning without providing a meaningful learning process to students. Information was only from teachers without any more effort made by students either in accessing, stringing, understanding, and disseminating the information they want to obtain [13], [14]. This is what provides digital literacy skills students are not well honed.

The problems that occur in underdeveloped areas are caused by several factors such as the education system in the school, the learning tools used, infrastructure facilities, learning processes (techniques, strategies and learning models), and students' motivation [13], [15], [16]. In addition, the demographic factors of schools are also important in determining the quality of a person's digital literacy. According to Lembani, Gunter, Breines & Dalu [17], the more left behind and remote an area is the more limited the reach in using and utilizing technological facilities that have an impact on one's digital literacy [18]. It can be seen from access to schools that are difficult to reach, both in terms of the quality of teachers and infrastructure that supports the quality of education.

In addition, the level of education also provides an important factor in the mastery of digital literacy of students. Some studies wrote that the freedom to use technology 'independently' when studying needs to be considered [19]. Delayed use of technology was said to be one of the factors of the lack of digital literacy of students in Indonesia [20]. This problem occurs in all genders, i.e. both men and women without exception. In addition, the results of the study also reported differences in digital literacy between men and women [21]. According to Tran, et al, [22], and Sarfo, Amartei, Adentwi & Brefowanita [23], women were more skilled at finding information using ICT, but men are superior in the use of ICT than in terms of finding information. Even though the level of digital literacy skills and skills is expected in all students.

Education evenly open to students could be an effort for quality human development to support the development of the nation evenly [24]. In supporting efforts to equalize education and ensure the quality of education, cooperation needs to be done from various parties such as improving various main facilities and supporters so that the education process can run well and optimally as expected. Various factors that can support efforts to equalize education in Indonesia, especially digital literacy such as paying attention to the quality of teachers, reviewing the level of education of students in each generation and the influence of gender on digital literacy. It is also in accordance with the SDGs (Sustainable Development Goals) of Quality Education, ensuring an inclusive and equitable quality of education and increasing lifelong learning opportunities for all students [6], [16]. In a sense, education is not only for some students in urban areas, but for all students evenly throughout Indonesia, such as rural areas.

Based on the description that has been explained both from the problems that occur in the field and the desired expectations, then by paying attention to the advantages of digital literacy, then before a movement is carried out to improve and develop the quality of digital literacy education of students, a preliminary analysis and a needs analysis of the initial profile of digital literacy of students and teachers in underdeveloped areas. The purpose of this study is to find out the initial profile of digital literacy of students and teachers, by compiling between schools, classes, and gender. The comparison of schools, classes, and gender in areas that are newly out of underdeveloped and remote areas is still lacking to be studied, so it needs to be studied further. The results of this study can be the basis in mapping the digital literacy of students and teachers and become the basis in developing a solution that is really appropriate and effective in empowering students' digital literacy in underdeveloped areas and areas that are just out of the underdeveloped areas.

Method

Type of the Study

This study was concurrent triangulation which combines qualitative and quantitative research in a balanced manner [25]. This study aims to find out the initial profile of digital literacy skill of students based on difference school, class, and gender. In addition, this study also aimed to obtain an overview of the digital literacy profile of teachers in underdeveloped areas. The results of this research could be the basis in mapping the digital literacy of students and teachers and the basis in developing an appropriate and effective solution in empowering the digital literacy of students in underdeveloped areas in Indonesia and internationally.

Sample

The research sample was students and teachers from state Junior High School (JHS) in underdeveloped areas in Jeneponto District, Indonesia. The selected schools of 15 state junior high schools, 450 students and 100 teachers in Jeneponto Distric (districts that just came out of the underdeveloped and remote zone in Indonesia in 2019) were selected by purposive sampling. Purposive sampling techniques were selected to determine rural and urban schools in Jeneponto. The study sample was described in detail in Table 1.

Table 1. Research Sample

Indicator	Number of students		Number of teachers	
Gender	Woman	237	Woman	63
	Man	213	Man	37
Class	Class VII	150		
	Class VIII	150		
	Class IX	150		
Age	12-13 Years	239	28-33 Years	56
	14-15 Years	211	34-40 Years	44

Instruments of the Study

Digital literacy instruments of students and teachers use modified instruments from Ng [26] and Greenstein [27] whose indicators consist of 1) finding information, 2) using various sources of information, 3) selecting information, 4) evaluating information, 5) considering the source and effect of information messages, and 6) using information to produce original work. The digital literacy assessment category is at intervals of 4.00-3.20 (Exemplary), 3.19-2.80 (Expert), 2.79-2.40 (Basic) and below from 2.40 (Beginner).

Data Collection and Data Analysis

Data collection used in-depth interviews, questionnaires and documentation. Interviews to explore information from students and teachers about expectations about digital literacy (45 students and 30 teachers randomly selected from the school in urban and rural area), questionnaires were used to measure the level of digital literacy skill of students and digital literacy teachers, as well as documentation techniques used to review supporting documents that were in association with the level of digital literacy of students and teachers in underdeveloped areas. To produce a strong interpretation of data, data validation is performed by combining interview results, questionnaires and documentation [28]. Data analysis consisted of three stages, namely data reduction, data presentation, and conclusion/verification withdrawal. In addition, descriptive and inferential data analysis (t-test and Annova test) was also carried out to produce more accurate data.

Results

The results of study showed that the average score of digital literacy skill of the total number of students sample in underdeveloped areas in Jeneponto District was in the beginners (schools in urban and rural area). In general, digital literacy indicator in finding information was the most accessible digital literacy for students, but digital literacy skill indicator in using information to produce an original work was still very low. The average score of digital literacy of students in urban and rural area in Jeneponto can be seen in Table 2.

Tabel 2. Average digital literacy of students in Jeneponto school based on indicators in urban and rural areas.

School	N	Area	Digital Literacy Indicators						Average	Category
			1	2	3	4	5	6		
JHS 6 Binamu	30	Urban	2.73	2.63	2.6	2.67	2.67	2.4	2.62	Basic
JHS 1 Binamu	30	Urban	2.86	2.67	2.7	2.7	2.77	2.4	2.68	Basic
JHS 1 Binamu Jeneponto	30	Urban	2.69	2.62	2.49	2.43	2.53	2.33	2.52	Basic
JHS 3 Binamu	30	Urban	2.69	2.59	2.56	2.49	2.46	2.37	2.53	Basic
JHS 9 Binamu	30	Urban	2.61	2.57	2.57	2.57	2.57	2.57	2.58	Basic
JHS 7 Binamu	30	Urban	2.31	2.5	2.5	2.43	2.5	1.91	2.36	Beginner
JHS 1 Arungkeke	27	Urban	2.78	2.63	2.56	2.59	2.67	2.7	2.66	Basic
Average			2.67	2.60	2.57	2.55	2.60	2.38	2.56	Basic
JHS 3 Rumbia	30	Rural	2.32	2.2	2.1	2.2	2.1	2.17	2.18	Beginner
JHS 8 West Bangkala	30	Rural	2.32	2.27	2.19	2.17	2.12	2.02	2.18	Beginner
JHS 1 Atap Punaga	30	Rural	2.39	2.31	2.29	2.23	2.18	1.96	2.23	Beginner
JHS 6 Bangkala Barat	30	Rural	2.66	2.52	2.27	2.24	2.21	2.23	2.36	Beginner
JHS 4 Kelara	30	Rural	2.31	2.27	2.23	2.19	2.17	2.08	2.21	Beginner
JHS 1 Rumbia	33	Rural	2.33	2.24	2.18	2.12	2.04	1.89	2.13	Beginner
JHS 1 Bangkala Barat	30	Rural	2.31	2.21	2.19	2.15	2.11	1.87	2.14	Beginner
JHS 5 Rumbia	30	Rural	2.43	2.37	2.2	2.27	2.3	2.23	2.30	Beginner
Average			2.38	2.30	2.21	2.20	2.15	2.06	2.22	Beginner

Indicator Notes:
1. Find information
2. Using various sources of information
3. Select information
4. Evaluating information

5. Consider the source and effect of informational messages, and
6. Use information to produce original work

Furthermore, the results of the t-test of digital literacy of students in urban and rural areas showed a significant difference (p <0.05, where p = 0.000). The level of digital literacy of students in different classes shows that higher-level classes have better digital literacy skills than lower classes. It is also seen that the digital literacy of students dominates in indicators of finding information compared to other digital literacy indicators. The average level of digital literacy of students based on different class levels can be seen in Table 3.

Table 3. Average Score of Digital Literacy Level of Students based on Different Classes

Class	N	Digital Literacy Indicators						Average	Category
		1	2	3	4	5	6		
Class VII	150	2.59	2.47	2.28	2.11	1.97	1.82	2.21	Beginner
Class VIII	150	2.64	2.62	2.32	2.29	2.18	2.09	2.36	Beginner
Class IX	150	2.98	2.71	2.60	2.58	2.32	2.26	2.58	Basic

Table 4 shows that based on the results of one-way ANOVA tests at different class levels to digital literacy, the significance value obtained is p = 0.000 (p <0.05) which shows that there were differences in digital literacy of students in different classes.

Table 4. Results of Anova Test of the Digital Literacy of Students based on Different Classes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.960	2	4.980	39.299	.000
Within Groups	56.643	447	.127		
Total	66.603	449			

The level of digital literacy of students of different genders indicates that men have better digital literacy skills than women. It is seen that the digital literacy of male students outperformed on all indicators, except indicator 1. The average level of digital literacy of students based on gender can be seen in Table 5.

Table 5. Average Score of Digital Literacy of Students based on Different Gender

Gender	N	Digital Literacy Indicators						Average	Category
		1	2	3	4	5	6		
Man	237	2.63	2.60	2.59	2.36	2.23	2.21	2.44	Basic
Woman	213	2.66	2.53	2.24	2.27	2.16	2.06	2.32	Beginner

Furthermore, the results of the t-test of digital literacy of students on gender showed a significant difference (p <0.05, where p = 0.001). The results of the average teacher's digital literation of the study in underdeveloped areas in Jeneponto showed in the basic category. The average digital literacy score of teachers in urban and rural area in Jeneponto can be seen in Table 6.

Table 6. Average Score Digital Literacy of The Teachers based on Indicators in Urban and Rural areas.

School	N	Area	Digital Literacy Indicators						Average	Category
			1	2	3	4	5	6		
JHS 6 Binamu	7	Urban	3.34	3.12	3.04	2.72	2.71	2.51	2.91	Expert
JHS 1 Binamu	6	Urban	3.21	3.19	3.01	2.76	2.7	2.45	2.89	Expert
JHS 1 Binamu Jeneponto	6	Urban	3.17	3.02	2.92	2.65	2.71	2.62	2.85	Expert
JHS 3 Binamu	6	Urban	3.22	3.06	2.91	2.72	2.76	2.48	2.86	Expert
JHS 9 Binamu	7	Urban	3.31	3.1	2.91	2.73	2.76	2.46	2.88	Expert
JHS 7 Binamu	6	Urban	2.91	2.86	2.52	2.43	2.32	1.87	2.49	Basic
JHS 1 Arungkeke	8	Urban	3.22	3.11	2.91	2.68	2.71	2.71	2.89	Expert
Average			3.20	3.07	2.89	2.67	2.67	2.44	2.82	Expert
JHS 3 Rumbia	6	Rural	3.16	3.06	2.98	2.51	2.43	2.23	2.73	Basic
JHS 8 West Bangkala	6	Rural	3.02	2.89	2.83	2.67	2.61	2.11	2.69	Basic
JHS 1 Atap Punaga	8	Rural	2.98	2.81	2.74	2.17	2.13	2.03	2.48	Basic
JHS 6 Bangkala Barat	7	Rural	2.99	2.84	2.73	2.23	2.13	2.07	2.77	Basic
JHS 4 Kelara	6	Rural	3.26	3.01	2.85	2.45	2.71	2.34	2.77	Basic
JHS 1 Rumbia	8	Rural	3.01	2.91	2.85	2.61	2.23	2.17	2.63	Basic
JHS 1 Bangkala Barat	7	Rural	2.97	2.81	2.74	2.45	2.15	1.74	2.48	Basic
JHS 5 Rumbia	7	Rural	3.06	2.88	2.76	2.56	2.39	2.23	2.65	Basic
Average			3.06	2.90	2.81	2.46	2.35	2.12	2.65	Basic

Furthermore, the results of the t-test of digital literacy of students on gender showed significant differences (p <0.05, where p = 0.004). The results of research in in-depth interviews with students and teachers in urban and rural areas in Jeneponto showed that

there were some expectations from students and teachers. The results of the in-depth interview were coded and then became a summary that can be seen in Table 7.

Table 7. Summary of interviews on the expectations of students and teachers towards the formation of digital literacy in Kab. Jeneponto

Subject	Hope
Students	Socialization of good internet use in learning **
	The use of technology during the learning process**
	Deliver technology-based tasks while at home*
	"Internet" technology networks that are easily accessible in underdeveloped areas**
	There is a computer that can be used **
	The learning process focuses more on students using ICT*
	Learning process that makes students unsaturated in learning to use ICT*
Teachers	Integration of technology-based curriculum */**
	Equalization of internet network **
	ICT competency workshop */**
	Presenting the right technology-based learning process **
	Need reflection after the learning process when using ICT*/**
	Presenting technology-based LKPD that can always enable students in learning *
	Presenting a computer device in learning at all times **
	Presenting a school environment that is literate of technology *
	A learning process that focuses on developing and cultivating a loving attitude towards the right facts in digital literacy*

Note
* Urban
** Rural

Discussion

The results showed that there were different results on each indicator of digital literacy of students. The score of students' skills and researchers in finding information is higher than other indicators such as skilled in using various sources of information, choosing relevant sources of information, evaluating information with the truth of the source, and being able to consider the source and effect of the message, and using information to create an original product. The results are in line with the results of a study drew & Forbes [13] and Mudra [29] which said, the earliest and easiest indicator of digital literacy is the ability to find information. In addition, the difference in location in the area in Jeneponto became one of the factors of low digital literacy of students and teachers.

The demographics of the school's location exerted a significant influence on a person's literacy level [30]. The level of digital literacy of students and teachers in urban areas was better than rural areas [31]. But in general, the average literacy level of students and teachers was still in the categories of "beginner" and "basic" (a combination of urban and rural schools). These results shows that the digital literacy of students and teachers in Jeneponto who just came out of the underdeveloped zone in 2019 still needs to be well empowered. According to Sarfo, et al. [23], the position of the region determined the level of digital literacy of a person, the more urban a location, the higher the level of digital literacy. Ease of accessing infrastructure and networking facilities was one of the factors of a person's high digital literacy in urban area [32]. In addition, modern lifestyle factors as well as the faster spread of information in urban areas are among the caused of a person's high digital literacy [33].

The level of digital literacy of students is also influenced by teacher factors. It seen in every school, the level of digital literacy of students and teachers is always in harmony. This proves that the high and low digital literacy of students can also be caused by the basic skills possessed by an teacher both in teaching and directing in school. According to Esteve-Mon, Llopis, & Adell-Segura [34], teacher as role models in empowering digital literacy in schools must be skilled to facilitate the transfer of information to their students. This was directly proportional to some studies, that the contribution of teachers was as a driver to students in awakening, managing, maintaining and channeling behavior in order to achieve patterns in accessing, stringing, understanding, and disseminating information in accordance with digital literacy skills [3], [35].

According to Liza & Adriyanti [5], digital technology had spread to all levels of education in Indonesia but most have not been able to use the technology properly, one of which is in underdeveloped areas or has been in the zone. Improper and correct use of technology can have "adverse" effects on individual and social survival [14]. Therefore, the main purpose of digital literacy should be expanded in order to educate the personality of the nation [10], [33]. Knowledge in discovering, evaluating, using, creating information and utilizing it wisely, healthy, intelligent, careful, precise and law-abiding to digital media could be expanded so that digital literacy skills both inside school and outside the school can run well [3], [36].

In addition, class level factors also have an influence in the mastery of digital literacy of students. In the results of the study, there was a significant association between different classes (classes VII, VIII and IX). The higher classes look more skilled in their mastery of digital literacy. According to Jan [18], higher levels of education had an influence in the skill of a person's digital literacy. Mindset, psychological and imperative factors of a learner in self-learning using ICT were also one of the causes of high digital literacy [37]. Psycholgic and the development of students around the age of 12-15 years in the process of development so it was important to always be given guidance and enlightenment so that students are always literate digital literacy but still able to sort out things that should be done and avoided [38]. According to Bahri, Palennari, Hardianto Muharni & Arifuddin [39] Jamaluddin, Zubaidah, Mahanal & Gofur [40], the positive attitude of students would form well when teachers are able to provide reinforcement and good examples during the learning process.

In addition, the mindset and trust of families in providing access to information using gadgets in learning at a more mature age was one factor in the high digital literacy of students [23]. In accordance with the results of the interview, in some cultures in

Jeneponto society gadgets can only be used when the age has entered 12 years and above with restricted conditions. According to Kuputri [41], delayed use of technology was said to be one factor in the lack of digital literacy of students such as in Jeneponto. Freedom of self-exploration of information in the "virtual world/ internet" is one of the main factors in the presence of digital literacy [6], [12], [13].

In gender research on digital literacy of students, it was found that gender differences have different influences in the high level of digital literacy of students. Women have lower digital literacy than men. It appears that women are only able to outperform men in terms of finding information, but lose in other indicators. According to Tran, et al. [22], women had rigor and foresight in finding information and filtering out existing information, while men are skilled in the use of technology. Local cultural factors that give women greater freedom of access to technology than women are the cause of men's high digital literacy. This is in line with the findings of research from STEM, which identified that emotional and cultural barriers were the obstacles women face in achieving equality of technology, especially in rural areas of the world that still hold hereditary customs [23].

According to Norte, Negreiros & Correia [42], Mudra [29] and Hazar [43], if someone want to empower digital literacy well, then motivating, collaborating together is the right way to improve digital literacy. Curriculum integration is also important to be done in the education system in a school so that the digital literacy of students and teachers can run well. This finding is in line with [13], that curriculum could be a director to everyone in the school unit in bejahar and teach together. In addition, in practice in underdeveloped areas, teachers should overcome existing shortcomings with learning reflection and present a pleasant learning process so that social systems and reaction principles can be achieved [44].

The expectations of students and teachers in urban and rural areas are also slightly different from the formation of digital literacy. It is seen that the expectations of students and teachers in urban areas focus on developing existing digital literacy basically, but in rural areas, the hope of "technology procurement" becomes the thing that is expected to be done. Presenting digital literacy students in a limited area (areas that have been left behind in terms of technological devices) can be done by cultivating and arousing love and a sense of belonging to facts, truth and science when using ICT [45]. In general, the expectations that students and teachers in areas that have just come out of the underdeveloped zone are the attention of the education world to pay attention to digital literacy.

Conclusion

Digital literacy of students and teachers in areas that have felt the zone of underdeveloped and remote areas is still classified as beginner and basic. It seen in urban areas had digital literacy skills were slightly better compared to rural areas. In addition, differences in class and gender levels have a significant influence on the digital literacy skill of students, where higher classes were better at empowering digital literacy, and men have better skills than women to digital literacy. The expectations of students and teachers in urban and rural areas were also different, urban areas expected to the development of digital literacy skills that have existed in a person before, while rural areas expected to the procurement of technology in their schools.

Acknowledgment

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Students' and Teachers' Digital Literacy Skill: A Comparative Study between Schools, Classes, and Genders in Urban and Rural Areas

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Abstract — Digital literacy is a skill that must be possessed by students in the era of the industrial revolution 4.0. But the equalization of education is one of the factors in empowering digital literacy, especially in areas that are newly out of underdeveloped and remote area. This study was concurrent triangulation research that combines qualitative and quantitative research. This study aimed to find out the initial profile of digital literacy skills of students and teachers in areas that are newly out of underdeveloped and remote area (urban and rural areas) located in Jeneponto District, Indonesia, involving 450 students and 100 teachers. Data collection using questionnaires, in-depth interviews and documentation (triangulation). Data were analyzed descriptively and inferentially. The results showed that; a) the level of digital literacy skill of students in the beginner category in 15 schools, 2) the level of digital literacy skill of teachers in the basic category in 15 schools, 3) there was a difference between different class levels to the digital literacy skills of students, 4) there was a difference between different genders to the digital literacy skills of students, and 5) the expectation of students and teachers in urban areas were to develop digital literacy skill that has been owned before..

> **Comment [1]:** What the next?

Keywords—Digital literacy skill, school, classroom, gender, urban and rural,

Introduction

Education for all and equalization of education is very important, especially in underdeveloped areas in Indonesia. The advancement of education in underdeveloped areas in Indonesia could be said to be very backward due to the lack of equitable distribution of educational services [1].

The equalization of education is not only the same material coverage of each region with certain examinations as standards that must be achieved nationally, but also maximizes teaching in accordance with the goals that have been designed and output contextually by each educational institution evenly in Indonesia. The impact of this imbalance and deviation is what causes the ability and skills of students can not be honed properly, one of which is the digital literacy of students [2].

> **Comment [2]:** Make in one paragraph to make the complete infomration

Digital literacy as knowledge and proficiency to use digital media, communication tools or networks in finding, evaluating, using, making information and utilizing it wisely, intelligently, carefully, precisely and law-abiding [3], [4]. According to UNESCO's rodmap (2015-2010), digital literacy was becoming an important pillar for the future in the world of education [5], [6]. According to Pangrazio [7], digital literacy was able to open opportunities to students in thinking, communicating, and working that affected to their learning success without the limits of place and time. If students in an educational environment have digital literacy skills, then they could utilize those skills to be productive, develop themselves and produce productive work as well [8], [9]. Therefore, awareness of the urgency of digital literacy skills needs to be improved among both students and teachers in decision making during the learning process. But the digital literacy skills of students in Indonesia look still low.

According to PISA 2015, a student is said to have a good level of literacy if he or she is able to analyze, reason, and communicate his knowledge and skills in mathematics, science and reading well. Of course, it is closely related to the condition of the education ecosystem in general and evenly distributed in a sampled region. Research results in Indonesian schools showed that the digital literacy of students is still below the standard of being in the category "Not Good" [10], [11]. In addition, in research conducted by Perdana, Yani, Jumadi & Rosana [12], students in Indonesia were only limited to "knowing" using technological devices, but not in their "implementation". The lack of digital literacy skills of students in Indonesia would have an impact on their learning outcomes [5].

In some literatures also write that in areas that have felt the zone of underdeveloped areas in Indoensia, there are still many students and few teachers who do not understand what is meant by digital literacy both in terms of understanding and implementation [10]. The learning process in underdeveloped areas is only limited to learning without providing a meaningful learning process to students. Information was only from teachers without any more effort made by students either in accessing, stringing, understanding, and disseminating the information they want to obtain [13], [14]. This is what provides digital literacy skills students are not well honed.

The problems that occur in underdeveloped areas are caused by several factors such as the education system in the school, the learning tools used, infrastructure facilities, learning processes (techniques, strategies and learning models), and students' motivation [13], [15], [16]. In addition, the demographic factors of schools are also important in determining the quality of a person's digital literacy. According to Lembani, Gunter, Breines & Dalu [17], the more left behind and remote an area is the more limited the reach in using and utilizing technological facilities that have an impact on one's digital literacy [18]. It can be seen from access to schools that are difficult to reach, both in terms of the quality of teachers and infrastructure that supports the quality of education.

In addition, the level of education also provides an important factor in the mastery of digital literacy of students. Some studies wrote that the freedom to use technology 'independently' when studying needs to be considered [19]. Delayed use of technology was said to be one of the factors of the lack of digital literacy of students in Indonesia [20]. This problem occurs in all genders, i.e. both men and women without exception. In addition, the results of the study also reported differences in digital literacy between men and women [21]. According to Tran, et al [22], and Sarfo, Amartei, Adentwi & Brefowanita [23], women were more skilled at finding information using ICT, but men are superior in the use of ICT than in terms of finding information. Even though the level of digital literacy skills and skills is expected in all students.

Education evenly open to students could be an effort for quality human development to support the development of the nation evenly [24]. In supporting efforts to equalize education and ensure the quality of education, cooperation needs to be done from various parties such as improving various main facilities and supporters so that the education process can run well and optimally as expected. Various factors that can support efforts to equalize education in Indonesia, especially digital literacy such as paying attention to the quality of teachers, reviewing the level of education of students in each generation and the influence of gender on digital literacy. It is also in accordance with the SDGs (Sustainable Development Goals) of Quality Education, ensuring an inclusive and equitable quality of education and increasing lifelong learning opportunities for all students [6], [16]. In a sense, education is not only for some students in urban areas, but for all students evenly throughout Indonesia, such as rural areas.

Based on the description that has been explained both from the problems that occur in the field and the desired expectations, then by paying attention to the advantages of digital literacy, then before a movement is carried out to improve and develop the quality of digital literacy education of students, a preliminary analysis and a needs analysis of the initial profile of digital literacy of students and teachers in underdeveloped areas. The purpose of this study is to find out the initial profile of digital literacy of students and teachers, by compiling between schools, classes, and gender. The comparison of schools, classes, and gender in areas that are newly out of underdeveloped and remote areas is still lacking to be studied, so it needs to be studied further. The results of this study can be the basis in mapping the digital literacy of students and teachers and become the basis in developing a solution that is really appropriate and effective in empowering students' digital literacy in underdeveloped areas and areas that are just out of the underdeveloped areas.

Method

Type of the Study

This study was concurrent triangulation which combines qualitative and quantitative research in a balanced manner [25]. This study aims to find out the initial profile of digital literacy skill of students based on difference school, class, and gender. In addition, this study also aimed to obtain an overview of the digital literacy profile of teachers in underdeveloped areas. The results of this research could be the basis in mapping the digital literacy of students and teachers and the basis in developing an appropriate and effective solution in empowering the digital literacy of students in underdeveloped areas in Indonesia and internationally.

Sample

The research sample was students and teachers from state Junior High School (JHS) in underdeveloped areas in Jeneponto District, Indonesia. The selected schools of 15 state junior high schools, 450 students and 100 teachers in Jeneponto Distric (districts that just came out of the underdeveloped and remote zone in Indonesia in 2019) were selected by purposive sampling. Purposive sampling techniques were selected to determine rural and urban schools in Jeneponto. The study sample was described in detail in Table 1.

Table 1. Research Sample

Indicator	Number of students		Number of teachers	
Gender	Woman	237	Woman	63
	Man	213	Man	37
Class	Class VII	150		
	Class VIII	150		
	Class IX	150		
Age	12-13 Years	239	28-33 Years	56
	14-15 Years	211	34-40 Years	44

Comment [3]: Add map of The location of research sample schools were determined the urban and rural area.

Instruments of the Study

Digital literacy instruments of students and teachers use modified instruments from Ng [26] and Greenstein [27] whose indicators consist of 1) finding information, 2) using various sources of information, 3) selecting information, 4) evaluating information, 5) considering the source and effect of information messages, and 6) using information to produce original work. The digital literacy assessment category is at intervals of 4.00-3.20 (Exemplary), 3.19-2.80 (Expert), 2.79-2.40 (Basic) and below from 2.40 (Beginner).

Data Collection and Data Analysis

Data collection used in-depth interviews, questionnaires and documentation. Interviews to explore information from students and teachers about expectations about digital literacy (45 students and 30 teachers randomly selected from the school in urban and rural area), questionnaires were used to measure the level of digital literacy skill of students and digital literacy teachers, as well as documentation techniques used to review supporting documents that were in association with the level of digital literacy of students and teachers in underdeveloped areas. To produce a strong interpretation of data, data validation is performed by combining interview results, questionnaires and documentation [28]. Data analysis consisted of three stages, namely data reduction, data presentation, and conclusion/verification withdrawal. In addition, descriptive and inferential data analysis (t-test and Annova test) was also carried out to produce more accurate data.

Results

The results of study showed that the average score of digital literacy skill of the total number of students sample in underdeveloped areas in Jeneponto District was in the beginners (schools in urban and rural area). In general, digital literacy indicator in finding information was the most accessible digital literacy for students, but digital literacy skill indicator in using information to produce an original work was still very low. The average score of digital literacy of students in urban and rural area in Jeneponto can be seen in Table 2.

Tabel 2. Average digital literacy of students in Jeneponto school based on indicators in urban and rural areas.

School	N	Area	Digital Literacy Indicators						Average	Category
			1	2	3	4	5	6		
JHS 6 Binamu	30	Urban	2.73	2.63	2.6	2.67	2.67	2.4	2.62	Basic
JHS 1 Binamu	30	Urban	2.86	2.67	2.7	2.7	2.77	2.4	2.68	Basic
JHS 1 Binamu Jeneponto	30	Urban	2.69	2.62	2.49	2.43	2.53	2.33	2.52	Basic
JHS 3 Binamu	30	Urban	2.69	2.59	2.56	2.49	2.46	2.37	2.53	Basic
JHS 9 Binamu	30	Urban	2.61	2.57	2.57	2.57	2.57	2.57	2.58	Basic
JHS 7 Binamu	30	Urban	2.31	2.5	2.5	2.43	2.5	1.91	2.36	Beginner
JHS 1 Arungkeke	27	Urban	2.78	2.63	2.56	2.59	2.67	2.7	2.66	Basic
Average			2.67	2.60	2.57	2.55	2.60	2.38	2.56	Basic
JHS 3 Rumbia	30	Rural	2.32	2.2	2.1	2.2	2.1	2.17	2.18	Beginner
JHS 8 West Bangkala	30	Rural	2.32	2.27	2.19	2.17	2.12	2.02	2.18	Beginner
JHS 1 Atap Punaga	30	Rural	2.39	2.31	2.29	2.23	2.18	1.96	2.23	Beginner
JHS 6 Bangkala Barat	30	Rural	2.66	2.52	2.27	2.24	2.21	2.23	2.36	Beginner
JHS 4 Kelara	30	Rural	2.31	2.27	2.23	2.19	2.17	2.08	2.21	Beginner
JHS 1 Rumbia	33	Rural	2.33	2.24	2.18	2.12	2.04	1.89	2.13	Beginner
JHS 1 Bangkala Barat	30	Rural	2.31	2.21	2.19	2.15	2.11	1.87	2.14	Beginner
JHS 5 Rumbia	30	Rural	2.43	2.37	2.2	2.27	2.3	2.23	2.30	Beginner
Average			2.38	2.30	2.21	2.20	2.15	2.06	2.22	Beginner

Indicator Notes:
1. Find information
2. Using various sources of information
3. Select information
4. Evaluating information

5. Consider the source and effect of informational messages, and
6. Use information to produce original work

Furthermore, the results of the t-test of digital literacy of students in urban and rural areas showed a significant difference (p <0.05, where p = 0.000). The level of digital literacy of students in different classes shows that higher-level classes have better digital literacy skills than lower classes. It is also seen that the digital literacy of students dominates in indicators of finding information compared to other digital literacy indicators. The average level of digital literacy of students based on different class levels can be seen in Table 3.

Table 3. Average Score of Digital Literacy Level of Students based on Different Classes

| Class | N | Digital Literacy Indicators | | | | | | Average | Category |
		1	2	3	4	5	6		
Class VII	150	2.59	2.47	2.28	2.11	1.97	1.82	2.21	Beginner
Class VIII	150	2.64	2.62	2.32	2.29	2.18	2.09	2.36	Beginner
Class IX	150	2.98	2.71	2.60	2.58	2.32	2.26	2.58	Basic

Table 4 shows that based on the results of one-way ANOVA tests at different class levels to digital literacy, the significance value obtained is p = 0.000 (p <0.05) which shows that there were differences in digital literacy of students in different classes.

Table 4. Results of Anova Test of the Digital Literacy of Students based on Different Classes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.960	2	4.980	39.299	.000
Within Groups	56.643	447	.127		
Total	66.603	449			

The level of digital literacy of students of different genders indicates that men have better digital literacy skills than women. It is seen that the digital literacy of male students outperformed on all indicators, except indicator 1. The average level of digital literacy of students based on gender can be seen in Table 5.

Table 5. Average Score of Digital Literacy of Students based on Different Gender

| Gender | N | Digital Literacy Indicators | | | | | | Average | Category |
		1	2	3	4	5	6		
Man	237	2.63	2.60	2.59	2.36	2.23	2.21	2.44	Basic
Woman	213	2.66	2.53	2.24	2.27	2.16	2.06	2.32	Beginner

Furthermore, the results of the t-test of digital literacy of students on gender showed a significant difference (p <0.05, where p = 0.001). The results of the average teacher's digital literation of the study in underdeveloped areas in Jeneponto showed in the basic category. The average digital literacy score of teachers in urban and rural area in Jeneponto can be seen in Table 6.

Table 6. Average Score Digital Literacy of The Teachers based on Indicators in Urban and Rural areas.

| School | N | Area | Digital Literacy Indicators | | | | | | Average | Category |
			1	2	3	4	5	6		
JHS 6 Binamu	7	Urban	3.34	3.12	3.04	2.72	2.71	2.51	2.91	Expert
JHS 1 Binamu	6	Urban	3.21	3.19	3.01	2.76	2.7	2.45	2.89	Expert
JHS 1 Binamu Jeneponto	6	Urban	3.17	3.02	2.92	2.65	2.71	2.62	2.85	Expert
JHS 3 Binamu	6	Urban	3.22	3.06	2.91	2.72	2.76	2.48	2.86	Expert
JHS 9 Binamu	7	Urban	3.31	3.1	2.91	2.73	2.76	2.46	2.88	Expert
JHS 7 Binamu	6	Urban	2.91	2.86	2.52	2.43	2.32	1.87	2.49	Basic
JHS 1 Arungkeke	8	Urban	3.22	3.11	2.91	2.68	2.71	2.71	2.89	Expert
Average			3.20	3.07	2.89	2.67	2.67	2.44	2.82	Expert
JHS 3 Rumbia	6	Rural	3.16	3.06	2.98	2.51	2.43	2.23	2.73	Basic
JHS 8 West Bangkala	6	Rural	3.02	2.89	2.83	2.67	2.61	2.11	2.69	Basic
JHS 1 Atap Punaga	8	Rural	2.98	2.81	2.74	2.17	2.13	2.03	2.48	Basic
JHS 6 Bangkala Barat	7	Rural	2.99	2.84	2.73	2.23	2.13	2.07	2.77	Basic
JHS 4 Kelara	6	Rural	3.26	3.01	2.85	2.45	2.71	2.34	2.77	Basic
JHS 1 Rumbia	8	Rural	3.01	2.91	2.85	2.61	2.23	2.17	2.63	Basic
JHS 1 Bangkala Barat	7	Rural	2.97	2.81	2.74	2.45	2.15	1.74	2.48	Basic
JHS 5 Rumbia	7	Rural	3.06	2.88	2.76	2.56	2.39	2.23	2.65	Basic
Average			3.06	2.90	2.81	2.46	2.35	2.12	2.65	Basic

Furthermore, the results of the t-test of digital literacy of students on gender showed significant differences (p <0.05, where p = 0.004). The results of research in in-depth interviews with students and teachers in urban and rural areas in Jeneponto showed that

there were some expectations from students and teachers. The results of the in-depth interview were coded and then became a summary that can be seen in Table 7.

Table 7. Summary of interviews on the expectations of students and teachers towards the formation of digital literacy in Kab. Jeneponto

Subject	Hope
Students	Socialization of good internet use in learning **
	The use of technology during the learning process**
	Deliver technology-based tasks while at home*
	"Internet" technology networks that are easily accessible in underdeveloped areas**
	There is a computer that can be used **
	The learning process focuses more on students using ICT*
	Learning process that makes students unsaturated in learning to use ICT*
Teachers	Integration of technology-based curriculum */**
	Equalization of internet network **
	ICT competency workshop */**
	Presenting the right technology-based learning process **
	Need reflection after the learning process when using ICT*/**
	Presenting technology-based LKPD that can always enable students in learning *
	Presenting a computer device in learning at all times **
	Presenting a school environment that is literate of technology *
	A learning process that focuses on developing and cultivating a loving attitude towards the right facts in digital literacy*

Note
* Urban
** Rural

Discussion

The results showed that there were different results on each indicator of digital literacy of students. The score of students' skills and researchers in finding information is higher than other indicators such as skilled in using various sources of information, choosing relevant sources of information, evaluating information with the truth of the source, and being able to consider the source and effect of the message, and using information to create an original product. The results are in line with the results of a study drew & Forbes [13] and Mudra [29] which said, the earliest and easiest indicator of digital literacy is the ability to find information. In addition, the difference in location in the area in Jeneponto became one of the factors of low digital literacy of students and teachers.

The demographics of the school's location exerted a significant influence on a person's literacy level [30]. The level of digital literacy of students and teachers in urban areas was better than rural areas [31]. But in general, the average literacy level of students and teachers was still in the categories of "beginner" and "basic" (a combination of urban and rural schools). These results shows that the digital literacy of students and teachers in Jeneponto who just came out of the underdeveloped zone in 2019 still needs to be well empowered. According to Sarfo, et al. [23], the position of the region determined the level of digital literacy of a person, the more urban a location, the higher the level of digital literacy. Ease of accessing infrastructure and networking facilities was one of the factors of a person's high digital literacy in urban area [32]. In addition, modern lifestyle factors as well as the faster spread of information in urban areas are among the caused of a person's high digital literacy [33].

The level of digital literacy of students is also influenced by teacher factors. It seen in every school, the level of digital literacy of students and teachers is always in harmony. This proves that the high and low digital literacy of students can also be caused by the basic skills possessed by an teacher both in teaching and directing in school. According to Esteve-Mon, Llopis, & Adell-Segura [34], teacher as role models in empowering digital literacy in schools must be skilled to facilitate the transfer of information to their students. This was directly proportional to some studies, that the contribution of teachers was as a driver to students in awakening, managing, maintaining and channeling behavior in order to achieve patterns in accessing, stringing, understanding, and disseminating information in accordance with digital literacy skills [3], [35].

According to Liza & Adriyanti [5], digital technology had spread to all levels of education in Indonesia but most have not been able to use the technology properly, one of which is in underdeveloped areas or has been in the zone. Improper and correct use of technology can have "adverse" effects on individual and social survival [14]. Therefore, the main purpose of digital literacy should be expanded in order to educate the personality of the nation [10], [33]. Knowledge in discovering, evaluating, using, creating information and utilizing it wisely, healthy, intelligent, careful, precise and law-abiding to digital media could be expanded so that digital literacy skills both inside school and outside the school can run well [3], [36].

In addition, class level factors also have an influence in the mastery of digital literacy of students. In the results of the study, there was a significant association between different classes (classes VII, VIII and IX). The higher classes look more skilled in their mastery of digital literacy. According to Jan [18], higher levels of education had an influence in the skill of a person's digital literacy. Mindset, psychological and imperative factors of a learner in self-learning using ICT were also one of the causes of high digital literacy [37]. Psycholgic and the development of students around the age of 12-15 years in the process of development so it was important to always be given guidance and enlightenment so that students are always literate digital literacy but still able to sort out things that should be done and avoided [38]. According to Bahri, Palennari, Hardianto Muharni & Arifuddin [39] Jamaluddin, Zubaidah, Mahanal & Gofur [40], the positive attitude of students would form well when teachers are able to provide reinforcement and good examples during the learning process.

In addition, the mindset and trust of families in providing access to information using gadgets in learning at a more mature age was one factor in the high digital literacy of students [23]. In accordance with the results of the interview, in some cultures in Jeneponto society gadgets can only be used when the age has entered 12 years and above with restricted conditions. According to Kuputri [41], delayed use of technology was said to be one factor in the lack of digital literacy of students such as in Jeneponto. Freedom of self-exploration of information in the "virtual world/ internet" is one of the main factors in the presence of digital literacy [6], [12], [13].

In gender research on digital literacy of students, it was found that gender differences have different influences in the high level of digital literacy of students. Women have lower digital literacy than men. It appears that women are only able to outperform men in terms of finding information, but lose in other indicators. According to Tran, et al. [22], women had rigor and foresight in finding information and filtering out existing information, while men are skilled in the use of technology. Local cultural factors that give women greater freedom of access to technology than women are the cause of men's high digital literacy. This is in line with the findings of research from STEM, which identified that emotional and cultural barriers were the obstacles women face in achieving equality of technology, especially in rural areas of the world that still hold hereditary customs [23].

According to Norte, Negreiros & Correia [42], Mudra [29] and Hazar [43], if someone want to empower digital literacy well, then motivating, collaborating together is the right way to improve digital literacy. Curriculum integration is also important to be done in the education system in a school so that the digital literacy of students and teachers can run well. This finding is in line with [13], that curriculum could be a director to everyone in the school unit in bejahar and teach together. In addition, in practice in underdeveloped areas, teachers should overcome existing shortcomings with learning reflection and present a pleasant learning process so that social systems and reaction principles can be achieved [44].

The expectations of students and teachers in urban and rural areas are also slightly different from the formation of digital literacy. It is seen that the expectations of students and teachers in urban areas focus on developing existing digital literacy basically, but in rural areas, the hope of "technology procurement" becomes the thing that is expected to be done. Presenting digital literacy students in a limited area (areas that have been left behind in terms of technological devices) can be done by cultivating and arousing love and a sense of belonging to facts, truth and science when using ICT [45]. In general, the expectations that students and teachers in areas that have just come out of the underdeveloped zone are the attention of the education world to pay attention to digital literacy.

Conclusion

Digital literacy of students and teachers in areas that have felt the zone of underdeveloped and remote areas is still classified as beginner and basic. It seen in urban areas had digital literacy skills were slightly better compared to rural areas. In addition, differences in class and gender levels have a significant influence on the digital literacy skill of students, where higher classes were better at empowering digital literacy, and men have better skills than women to digital literacy. The expectations of students and teachers in urban and rural areas were also different, urban areas expected to the development of digital literacy skills that have existed in a person before, while rural areas expected to the procurement of technology in their schools.

> **Comment [8]:** What about the role/implication?

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Students' and Teachers' Digital Literacy Skill: A Comparative Study between Schools, Classes, and Genders in Urban and Rural Areas

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Abstract — Digital literacy is a skill that must be possessed by students in the era of the industrial revolution 4.0. But the equalization of education is one of the factors in empowering digital literacy, especially in areas that are newly out of underdeveloped and remote area. This study was concurrent triangulation research that combines qualitative and quantitative research. This study aimed to find out the initial profile of digital literacy skills of students and teachers in areas that are newly out of underdeveloped and remote area (urban and rural areas) located in Jeneponto District, Indonesia, involving 450 students and 100 teachers. Data collection using questionnaires, in-depth interviews and documentation (triangulation). Data were analyzed descriptively and inferentially. The results showed that; a) the level of digital literacy skill of students in the beginner category in 15 schools, 2) the level of digital literacy skill of teachers in the basic category in 15 schools, 3) there was a difference between different class levels to the digital literacy skills of students, 4) there was a difference between different genders to the digital literacy skills of students, and 5) the expectation of students and teachers in urban areas were to develop digital literacy skill that has been owned before, and the hope of rural areas is to do the procurement of technology in learningin schools.

Keywords—Digital literacy skill, school, classroom, gender, urban and rural,

Introduction

Education for all and equalization of education is very important, especially in underdeveloped areas in Indonesia. The advancement of education in underdeveloped areas in Indonesia could be said to be very backward due to the lack of equitable distribution of educational services [1]. The equalization of education is not only the same material coverage of each region with certain examinations as standards that must be achieved nationally, but also maximizes teaching in accordance with the goals that have been designed and output contextually by each educational institution evenly in Indonesia. The impact of this imbalance and deviation is what causes the ability and skills of students can not be honed properly, one of which is the digital literacy of students [2].

Digital literacy as knowledge and proficiency to use digital media, communication tools or networks in finding, evaluating, using, making information and utilizing it wisely, intelligently, carefully, precisely and law-abiding [3], [4]. According to UNESCO's rodmap (2015-2010), digital literacy was becoming an important pillar for the future in the world of education [5], [6]. According to Pangrazio [7], digital literacy was able to open opportunities to students in thinking, communicating, and working that affected to their learning success without the limits of place and time. If students in an educational environment have digital literacy skills, then they could utilize those skills to be productive, develop themselves and produce productive work as well [8], [9]. Therefore, awareness of the urgency of digital literacy skills needs to be improved among both students and teachers in decision making during the learning process. But the digital literacy skills of students in Indonesia look still low.

According to PISA 2015, a student is said to have a good level of literacy if he or she is able to analyze, reason, and communicate his knowledge and skills in mathematics, science and reading well. Of course, it is closely related to the condition of the education ecosystem in general and evenly distributed in a sampled region. Research results in Indonesian schools showed that the digital literacy of students is still below the standard of being in the category "Not Good" [10], [11]. In addition, in research conducted by Perdana, Yani, Jumadi & Rosana [12], students in Indonesia were only limited to "knowing" using technological devices, but not in their "implementation". The lack of digital literacy skills of students in Indonesia would have an impact on their learning outcomes [5].

In some literatures also write that in areas that have felt the zone of underdeveloped areas in Indoensia, there are still many students and few teachers who do not understand what is meant by digital literacy both in terms of understanding and implementation [10]. The learning process in underdeveloped areas is only limited to learning without providing a meaningful learning process to students. Information was only from teachers without any more effort made by students either in accessing, stringing, understanding, and disseminating the information they want to obtain [13], [14]. This is what provides digital literacy skills students are not well honed.

The problems that occur in underdeveloped areas are caused by several factors such as the education system in the school, the learning tools used, infrastructure facilities, learning processes (techniques, strategies and learning models), and students' motivation [13], [15], [16]. In addition, the demographic factors of schools are also important in determining the quality of a person's digital literacy. According to Lembani, Gunter, Breines & Dalu [17], the more left behind and remote an area is the more limited the reach in using and utilizing technological facilities that have an impact on one's digital literacy [18]. It can be seen from access to schools that are difficult to reach, both in terms of the quality of teachers and infrastructure that supports the quality of education.

In addition, the level of education also provides an important factor in the mastery of digital literacy of students. Some studies wrote that the freedom to use technology 'independently' when studying needs to be considered [19]. Delayed use of technology was said to be one of the factors of the lack of digital literacy of students in Indonesia [20]. This problem occurs in all genders, i.e. both men and women without exception. In addition, the results of the study also reported differences in digital literacy between men and women [21]. According to Tran, et al, [22], and Sarfo, Amartei, Adentwi & Brefowanita [23], women were more skilled at finding information using ICT, but men are superior in the use of ICT than in terms of finding information. Even though the level of digital literacy skills and skills is expected in all students.

Education evenly open to students could be an effort for quality human development to support the development of the nation evenly [24]. In supporting efforts to equalize education and ensure the quality of education, cooperation needs to be done from various parties such as improving various main facilities and supporters so that the education process can run well and optimally as expected. Various factors that can support efforts to equalize education in Indonesia, especially digital literacy such as paying attention to the quality of teachers, reviewing the level of education of students in each generation and the influence of gender on digital literacy. It is also in accordance with the SDGs (Sustainable Development Goals) of Quality Education, ensuring an inclusive and equitable quality of education and increasing lifelong learning opportunities for all students [6], [16]. In a sense, education is not only for some students in urban areas, but for all students evenly throughout Indonesia, such as rural areas.

Based on the description that has been explained both from the problems that occur in the field and the desired expectations, then by paying attention to the advantages of digital literacy, then before a movement is carried out to improve and develop the quality of digital literacy education of students, a preliminary analysis and a needs analysis of the initial profile of digital literacy of students and teachers in underdeveloped areas. The purpose of this study is to find out the initial profile of digital literacy of students and teachers, by compiling between schools, classes, and gender. The comparison of schools, classes, and gender in areas that are newly out of underdeveloped and remote areas is still lacking to be studied, so it needs to be studied further. The results of this study can be the basis in mapping the digital literacy of students and teachers and become the basis in developing a solution that is really appropriate and effective in empowering students' digital literacy in underdeveloped areas and areas that are just out of the underdeveloped areas.

Method

Type of the Study

This study was concurrent triangulation which combines qualitative and quantitative research in a balanced manner [25]. This study aims to find out the initial profile of digital literacy skill of students based on difference school, class, and gender. In addition, this study also aimed to obtain an overview of the digital literacy profile of teachers in underdeveloped areas. The results of this research could be the basis in mapping the digital literacy of students and teachers and the basis in developing an appropriate and effective solution in empowering the digital literacy of students in underdeveloped areas in Indonesia and internationally.

Sample

The research sample was students and teachers from state Junior High School (JHS) in underdeveloped areas in Jeneponto District, Indonesia. The selected schools of 15 state junior high schools, 450 students and 100 teachers in Jeneponto Distric (districts that just came out of the underdeveloped and remote zone in Indonesia in 2019) were selected by purposive sampling. Purposive sampling techniques were selected to determine rural and urban schools in Jeneponto. The study sample was described in detail in Table 1.

Table 1. Research Sample

Indicator	Number of students		Number of teachers	
Gender	Woman	237	Woman	63
	Man	213	Man	37
Class	Class VII	150		
	Class VIII	150		
	Class IX	150		
Age	12-13 Years	239	28-33 Years	56
	14-15 Years	211	34-40 Years	44

The location of research sample schools were visualized by the Figure 1 and determined the urban and rural area.

Map Description

⬠ **City**   🏫 **Urban School**   **Rural School**   ∥ **Street Province**   ╱ **Street Village**

1. JHS 1 Binamu
   Jeneponto
2. JHS 3 Binamu
3. JHS 6 Binamu
4. JHS 1 Binamu
5. JHS 9 Binamu

6. JHS 7 Binamu
7. JHS 1 Arungkeke
8. JHS 1 Kelara
9. JHS 3 Rumbia
10. JHS 5 Rumbia

11. JHS 1 Rumbia
12. JHS 6 Bangkala Barat
13. JHS 8 Bangkala Barat
14. JHS 1 Bangkala Barat
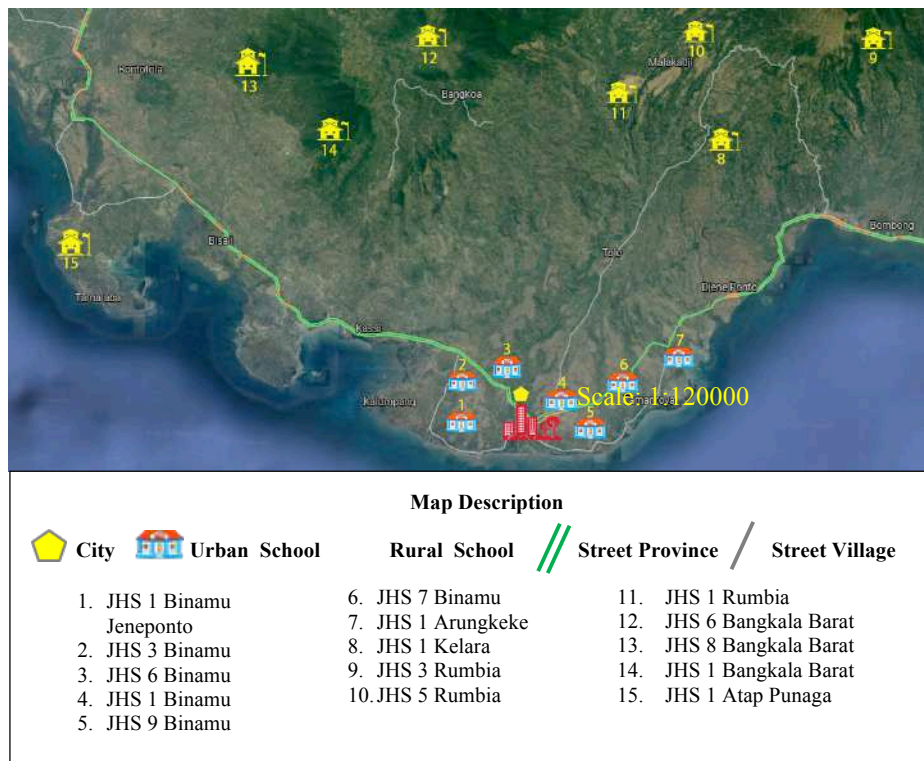15. JHS 1 Atap Punaga

Figure 1. Demographic Map of Schools in Kab. Jeneponto in Urban and Rural Areas

Instruments of the Study

Digital literacy instruments of students and teachers use modified instruments from Ng [26] and Greenstein [27] whose indicators consist of 1) finding information, 2) using various sources of information, 3) selecting information, 4) evaluating information, 5) considering the source and effect of information messages, and 6) using information to produce original work. The digital literacy assessment category is at intervals of 4.00-3.20 (Exemplary), 3.19-2.80 (Expert), 2.79-2.40 (Basic) and below from 2.40 (Beginner).

Data Collection and Data Analysis

Data collection used in-depth interviews, questionnaires and documentation. Interviews to explore information from students and teachers about expectations about digital literacy (45 students and 30 teachers randomly selected from the school in urban and rural area), questionnaires were used to measure the level of digital literacy skill of students and digital literacy teachers, as well as documentation techniques used to review supporting documents that were in association with the level of digital literacy of students and teachers in underdeveloped areas. To produce a strong interpretation of data, data validation is performed by combining interview results, questionnaires and documentation [28]. Data analysis consisted of three stages, namely data reduction, data presentation, and conclusion/verification withdrawal. In addition, descriptive and inferential data analysis (t-test and Annova test) was also carried out to produce more accurate data.

Results

The results of study showed that the average score of digital literacy skill of the total number of students sample in underdeveloped areas in Jeneponto District was in the beginners (schools in urban and rural area). In general, digital literacy indicator in finding information was the most accessible digital literacy for students, but digital literacy skill indicator in using information to produce an original work was still very low. The average score of digital literacy of students in urban and rural area in Jeneponto can be seen in Table 2.

Tabel 2. Average digital literacy of students in Jeneponto school based on indicators in urban and rural areas.

School	N	Area	Digital Literacy Indicators						Average	Category
			1	2	3	4	5	6		
JHS 6 Binamu	30	Urban	2.73	2.63	2.6	2.67	2.67	2.4	2.62	Basic
JHS 1 Binamu	30	Urban	2.86	2.67	2.7	2.7	2.77	2.4	2.68	Basic
JHS 1 Binamu Jeneponto	30	Urban	2.69	2.62	2.49	2.43	2.53	2.33	2.52	Basic
JHS 3 Binamu	30	Urban	2.69	2.59	2.56	2.49	2.46	2.37	2.53	Basic
JHS 9 Binamu	30	Urban	2.61	2.57	2.57	2.57	2.57	2.57	2.58	Basic
JHS 7 Binamu	30	Urban	2.31	2.5	2.5	2.43	2.5	1.91	2.36	Beginner
JHS 1 Arungkeke	27	Urban	2.78	2.63	2.56	2.59	2.67	2.7	2.66	Basic
Average			2.67	2.60	2.57	2.55	2.60	2.38	2.56	Basic
JHS 3 Rumbia	30	Rural	2.32	2.2	2.1	2.2	2.1	2.17	2.18	Beginner
JHS 8 West Bangkala	30	Rural	2.32	2.27	2.19	2.17	2.12	2.02	2.18	Beginner
JHS 1 Atap Punaga	30	Rural	2.39	2.31	2.29	2.23	2.18	1.96	2.23	Beginner
JHS 6 Bangkala Barat	30	Rural	2.66	2.52	2.27	2.24	2.21	2.23	2.36	Beginner
JHS 4 Kelara	30	Rural	2.31	2.27	2.23	2.19	2.17	2.08	2.21	Beginner
JHS 1 Rumbia	33	Rural	2.33	2.24	2.18	2.12	2.04	1.89	2.13	Beginner
JHS 1 Bangkala Barat	30	Rural	2.31	2.21	2.19	2.15	2.11	1.87	2.14	Beginner
JHS 5 Rumbia	30	Rural	2.43	2.37	2.2	2.27	2.3	2.23	2.30	Beginner
Average			2.38	2.30	2.21	2.20	2.15	2.06	2.22	Beginner

Indicator Notes:
1. Find information
2. Using various sources of information
3. Select information
4. Evaluating information
5. Consider the source and effect of informational messages, and
6. Use information to produce original work

Furthermore, the results of the t-test of digital literacy of students in urban and rural areas showed a significant difference (p <0.05, where p = 0.000). These results shows that there were differences in the digital literacy skill of students in urban and rural areas that can be seen in Table 3.

Table 3. Results of t-test of Digital Literacy Test of Students on Urban and Rural Area

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Literacy Digital	Equal variances assumed	274.084	.000	10.803	448	.000
	Equal variances not assumed			10.322	300.142	.000

The level of digital literacy of students in different classes shows that higher-level classes have better digital literacy skills than lower classes. It is also seen that the digital literacy of students dominates in indicators of finding information compared to other digital literacy indicators. The average level of digital literacy of students based on different class levels can be seen in Table 4.

Table 4. Average Score of Digital Literacy Level of Students based on Different Classes

Class	N	Digital Literacy Indicators						Average	Category
		1	2	3	4	5	6		
Class VII	150	2.59	2.47	2.28	2.11	1.97	1.82	2.21	Beginner
Class VIII	150	2.64	2.62	2.32	2.29	2.18	2.09	2.36	Beginner
Class IX	150	2.98	2.71	2.60	2.58	2.32	2.26	2.58	Basic

Table 5 shows that based on the results of one-way ANOVA tests at different class levels to digital literacy, the significance value obtained is p = 0.000 (p <0.05) which shows that there were differences in digital literacy of students in different classes.

Table 5. Results of Anova Test of the Digital Literacy of Students based on Different Classes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.960	2	4.980	39.299	.000
Within Groups	56.643	447	.127		
Total	66.603	449			

The level of digital literacy of students of different genders indicates that men have better digital literacy skills than women. It is seen that the digital literacy of male students outperformed on all indicators, except indicator 1. The average level of digital literacy of students based on gender can be seen in Table 6.

Table 6. Average Score of Digital Literacy of Students based on Different Gender

Gender	N	Digital Literacy Indicators						Average	Category
		1	2	3	4	5	6		
Man	237	2.63	2.60	2.59	2.36	2.23	2.21	2.44	Basic
Woman	213	2.66	2.53	2.24	2.27	2.16	2.06	2.32	Beginner

Furthermore, the results of the t-test of digital literacy of students on gender showed a significant difference ($p < 0.05$, where $p = 0.001$). These results show that there were the differences in students' digital literacy based in different gender that can be seen in Table 7.

Table 7. Results of t-test of The Digital Literacy based on Different Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Digital Literacy	Equal variances assumed	35.518	.000	3.233	448	.001
	Equal variances not assumed			3.259	447.006	.001

The results of the average teacher's digital literation of the study in underdeveloped areas in Jeneponto showed in the basic category. The average digital literacy score of teachers in urban and rural area in Jeneponto can be seen in Table 8.

Table 8. Average Score Digital Literacy of The Teachers based on Indicators in Urban and Rural areas.

School	N	Area	Digital Literacy Indicators						Average	Category
			1	2	3	4	5	6		
JHS 6 Binamu	7	Urban	3.34	3.12	3.04	2.72	2.71	2.51	2.91	Expert
JHS 1 Binamu	6	Urban	3.21	3.19	3.01	2.76	2.7	2.45	2.89	Expert
JHS 1 Binamu Jeneponto	6	Urban	3.17	3.02	2.92	2.65	2.71	2.62	2.85	Expert
JHS 3 Binamu	6	Urban	3.22	3.06	2.91	2.72	2.76	2.48	2.86	Expert
JHS 9 Binamu	7	Urban	3.31	3.1	2.91	2.73	2.76	2.46	2.88	Expert
JHS 7 Binamu	6	Urban	2.91	2.86	2.52	2.43	2.32	1.87	2.49	Basic
JHS 1 Arungkeke	8	Urban	3.22	3.11	2.91	2.68	2.71	2.71	2.89	Expert
Average			3.20	3.07	2.89	2.67	2.67	2.44	2.82	Expert
JHS 3 Rumbia	6	Rural	3.16	3.06	2.98	2.51	2.43	2.23	2.73	Basic
JHS 8 West Bangkala	6	Rural	3.02	2.89	2.83	2.67	2.61	2.11	2.69	Basic
JHS 1 Atap Punaga	8	Rural	2.98	2.81	2.74	2.17	2.13	2.03	2.48	Basic
JHS 6 Bangkala Barat	7	Rural	2.99	2.84	2.73	2.23	2.13	2.07	2.77	Basic
JHS 4 Kelara	6	Rural	3.26	3.01	2.85	2.45	2.71	2.34	2.77	Basic
JHS 1 Rumbia	8	Rural	3.01	2.91	2.85	2.61	2.23	2.17	2.63	Basic
JHS 1 Bangkala Barat	7	Rural	2.97	2.81	2.74	2.45	2.15	1.74	2.48	Basic
JHS 5 Rumbia	7	Rural	3.06	2.88	2.76	2.56	2.39	2.23	2.65	Basic
Average			3.06	2.90	2.81	2.46	2.35	2.12	2.65	Basic

Furthermore, the results of the t-test of digital literacy of students on gender showed significant differences ($p < 0.05$, where $p = 0.004$). These results show that there were differences in students' digital literacy in gender that can be seen in Table 9.

Table 9. Results of t-test of Teachers' Digital Literacy Skill in Urban and Rural Areas

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Digital Literacy Teacher	*Equal variances assumed*	16.306	.000	2.936	98	.004
	Equal variances not assumed			2.991	97.523	.004

The results of research in in-depth interviews with students and teachers in urban and rural areas in Jeneponto showed that there were some expectations from students and teachers. The results of the in-depth interview were coded and then became a summary that can be seen in Table 10.

Table 10. Summary of interviews on the expectations of students and teachers towards the formation of digital literacy in Kab. Jeneponto

Subject	Hope
Students	Socialization of good internet use in learning **
	The use of technology during the learning process**
	Deliver technology-based tasks while at home*
	"Internet" technology networks that are easily accessible in underdeveloped areas**
	There is a computer that can be used **
	The learning process focuses more on students using ICT*
	Learning process that makes students unsaturated in learning to use ICT*
Teachers	Integration of technology-based curriculum */**
	Equalization of internet network **
	ICT competency workshop */**
	Presenting the right technology-based learning process **
	Need reflection after the learning process when using ICT*/**
	Presenting technology-based LKPD that can always enable students in learning *
	Presenting a computer device in learning at all times **
	Presenting a school environment that is literate of technology *
	A learning process that focuses on developing and cultivating a loving attitude towards the right facts in digital literacy*

Note

* Urban

** Rural

Discussion

The results showed that there were different results on each indicator of digital literacy of students. The score of students' skills and researchers in finding information is higher than other indicators such as skilled in using various sources of information, choosing relevant sources of information, evaluating information with the truth of the source, and being able to consider the source and effect of the message, and using information to create an original product. The results are in line with the results of a study drew & Forbes [13] and Mudra [29] which said, the earliest and easiest indicator of digital literacy is the ability to find information. In addition, the difference in location in the area in Jeneponto became one of the factors of low digital literacy of students and teachers.

The demographics of the school's location exerted a significant influence on a person's literacy level [30]. The level of digital literacy of students and teachers in urban areas was better than rural areas [31]. But in general, the average literacy level of students and teachers was still in the categories of "beginner" and "basic" (a combination of urban and rural schools). These results shows that the digital literacy of students and teachers in Jeneponto who just came out of the underdeveloped zone in 2019 still needs to be well empowered. According to Sarfo, et al. [23], the position of the region determined the level of digital literacy of a person, the more urban a location, the higher the level of digital literacy. Ease of accessing infrastructure and networking facilities was one of the factors of a person's high digital literacy in urban area [32]. In addition, modern lifestyle factors as well as the faster spread of information in urban areas are among the caused of a person's high digital literacy [33].

The level of digital literacy of students is also influenced by teacher factors. It seen in every school, the level of digital literacy of students and teachers is always in harmony. This proves that the high and low digital literacy of students can also be caused by the basic skills possessed by an teacher both in teaching and directing in school. According to Esteve-Mon, Llopis, & Adell-Segura [34], teacher as role models in empowering digital literacy in schools must be skilled to facilitate the transfer of information to their students. This was directly proportional to some studies, that the contribution of teachers was as a driver to students in awakening, managing, maintaining and channeling behavior in order to achieve patterns in accessing, stringing, understanding, and disseminating information in accordance with digital literacy skills [3], [35].

According to Liza & Adriyanti [5], digital technology had spread to all levels of education in Indonesia but most have not been able to use the technology properly, one of which is in underdeveloped areas or has been in the zone. Improper and correct use of technology can have "adverse" effects on individual and social survival [14]. Therefore, the main purpose of digital literacy should be expanded in order to educate the personality of the nation [10], [33]. Knowledge in discovering, evaluating, using, creating information and utilizing it wisely, healthy, intelligent, careful, precise and law-abiding to digital media could be expanded so that digital literacy skills both inside school and outside the school can run well [3], [36].

In addition, class level factors also have an influence in the mastery of digital literacy of students. In the results of the study, there was a significant association between different classes (classes VII, VIII and IX). The higher classes look more skilled in their mastery of digital literacy. According to Jan [18], higher levels of education had an influence in the skill of a person's digital literacy. Mindset, psychological and imperative factors of a learner in self-learning using ICT were also one of the causes of high digital literacy [37]. Psycholgic and the development of students around the age of 12-15 years in the process of development so it was important to always be given guidance and enlightenment so that students are always literate digital literacy but still able to sort out things that should be done and avoided [38]. According to Bahri, Palennari, Hardianto Muharni & Arifuddin [39] Jamaluddin, Zubaidah, Mahanal & Gofur [40], the positive attitude of students would form well when teachers are able to provide reinforcement and good examples during the learning process.

In addition, the mindset and trust of families in providing access to information using gadgets in learning at a more mature age was one factor in the high digital literacy of students [23]. In accordance with the results of the interview, in some cultures in Jeneponto society gadgets can only be used when the age has entered 12 years and above with restricted conditions. According to Kuputri [41], delayed use of technology was said to be one factor in the lack of digital literacy of students such as in Jeneponto. Freedom of self-exploration of information in the "virtual world/ internet" is one of the main factors in the presence of digital literacy [6], [12], [13].

In gender research on digital literacy of students, it was found that gender differences have different influences in the high level of digital literacy of students. Women have lower digital literacy than men. It appears that women are only able to outperform men in terms of finding information, but lose in other indicators. According to Tran, et al. [22], women had rigor and foresight in finding information and filtering out existing information, while men are skilled in the use of technology. Local cultural factors that give women greater freedom of access to technology than women are the cause of men's high digital literacy. This is in line with the findings of research from STEM, which identified that emotional and cultural barriers were the obstacles women face in achieving equality of technology, especially in rural areas of the world that still hold hereditary customs [23].

According to Norte, Negreiros & Correia [42], Mudra [29] and Hazar [43], if someone want to empower digital literacy well, then motivating, collaborating together is the right way to improve digital literacy. Curriculum integration is also important to be done in the education system in a school so that the digital literacy of students and teachers can run well. This finding is in line with [13], that curriculum could be a director to everyone in the school unit in bejahar and teach together. In addition, in practice in underdeveloped areas, teachers should overcome existing shortcomings with learning reflection and present a pleasant learning process so that social systems and reaction principles can be achieved [44].

The expectations of students and teachers in urban and rural areas are also slightly different from the formation of digital literacy. It is seen that the expectations of students and teachers in urban areas focus on developing existing digital literacy basically, but in rural areas, the hope of "technology procurement" becomes the thing that is expected to be done. Presenting digital literacy students in a limited area (areas that have been left behind in terms of technological devices) can be done by cultivating and arousing love and a sense of belonging to facts, truth and science when using ICT [45]. In general, the expectations that students and teachers in areas that have just come out of the underdeveloped zone are the attention of the education world to pay attention to digital literacy.

Conclusion

Digital literacy of students and teachers in areas that have felt the zone of underdeveloped and remote areas is still classified as beginner and basic. It seen in urban areas had digital literacy skills were slightly better compared to rural areas. In addition, differences in class and gender levels have a significant influence on the digital literacy skill of students, where higher classes were better at empowering digital literacy, and men have better skills than women to digital literacy. The expectations of students and teachers in urban and rural areas were also different, urban areas expected to the development of digital literacy skills that have existed in a person before, while rural areas expected to the procurement of technology in their schools. In general, the empowerment of digital literacy of students and teachers needs to be empowered to the maximum so that equitable distribution of education in Indonesia can be achieved.

Acknowledgment

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Students' and Teachers' Digital Literacy Skill: A Comparative Study between Schools, Classes, and Genders in Urban and Rural Areas

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Abstract: *Digital literacy is a skill that must be possessed by students in the era of the industrial revolution 4.0. But the equalization of education is one of the factors in empowering digital literacy, especially inareas that are newly out of underdeveloped and remote area.This study was concurrent triangulation research that combines qualitative and quantitative research.This study aimed to find out the initial profile of digital literacy skills of students and teachers in areas that are newly out of underdeveloped and remote area (urban and rural areas) located in Jeneponto District, Indonesia, involving 450 students and 100teachers. Data collection using questionnaires, in-depth interviews and documentation (triangulation). Data were analyzed descriptively and inferentially. The results showed that; a) the level of digital literacy skill of students in the beginner category in 15 schools,2) the level of digital literacy skill of teachers in the basic category in 15 schools, 3)therewas a difference between different class levels to the digital literacyskills of students, 4)there wasa difference between different genders to the digital literacyskills ofstudents, and 5) the expectation of students and teachersin urban areas were to develop digital literacy skill that has been owned before, and the hope of rural areas is to do the procurement of technology in learningin schools.*

Keywords: Digital literacy skill, school, classroom, gender, urban and rural

1. Introduction

Education for all and equalization of education is very important, especially in underdeveloped areas in Indonesia. The advancement of education in underdeveloped areas in Indonesia could be said to be very backward due to the lack of equitable distribution of educational services[1]. The equalization of education is not only the same material coverage of each region with certain examinations as standards that must be achieved nationally, but also maximizes teaching in accordance with the goals that have been designed and output contextually by each educational institution evenly in Indonesia. The impact of this imbalance and deviation is what causes the ability and skills of students can not be honed properly, one of which is the digital literacy of students [2].

Digital literacy as knowledge and proficiency to use digital media, communication tools or networks in finding, evaluating, using, making information and utilizing it wisely, intelligently, carefully, precisely and law-abiding[3], [4]. According to UNESCO's rodmap (2015-2010), digital literacy was becoming an important pillar for the future in the world of education[5], [6]. According to Pangrazio[7], digital literacy was able to open opportunities to students in thinking, communicating, and working that affected to their learning success without the limits of place and time. If students in an educational environment have digital literacy skills, then

they could utilize those skills to be productive, develop themselves and produce productive work as well [8], [9]. Therefore, awareness of the urgency of digital literacy skills needs to be improved among both students and teachers in decision making during the learning process. But the digital literacy skills of students in Indonesia look still low.

According to PISA 2015, a student is said to have a good level of literacy if he or she is able to analyze, reason, and communicate his knowledge and skills in mathematics, science and reading well. Of course, it is closely related to the condition of the education ecosystem in general and evenly distributed in a sampled region. Research results in Indonesian schools showed that the digital literacy of students is still below the standard of being in the category "Not Good" [10], [11]. In addition, in research conducted by Perdana, Yani, Jumadi&Rosana[12], students in Indonesia were only limited to "knowing" using technological devices, but not in their "implementation". The lack of digital literacy skills of students in Indonesia would have an impact on their learning outcomes[5].

In some literatures also write that in areas that have felt the zone of underdeveloped areas in Indoensia, there are still many students and few teachers who do not understand what is meant by digital literacy both in terms of understanding and implementation[10]. The learning process in underdeveloped areas is only limited to learning without providing a

meaningful learning process to students. Information was only from teachers without any more effort made by students either in accessing, stringing, understanding, and disseminating the information they want to obtain[13], [14]. This is what provides digital literacy skills students are not well honed.

The problems that occur in underdeveloped areas are caused by several factors such as the education system in the school, the learning tools used, infrastructure facilities, learning processes (techniques, strategies and learning models), and students' motivation[13], [15], [16]. In addition, the demographic factors of schools are also important in determining the quality of a person's digital literacy. According toLembani, Gunter, Breines&Dalu[17], the more left behind and remote an area is the more limited the reach in using and utilizing technological facilities that have an impact on one's digital literacy[18]. It can be seen from access to schools that are difficult to reach, both in terms of the quality of teachers and infrastructure that supports the quality of education.

In addition, the level of education also provides an important factor in the mastery of digital literacy of students. Some studies wrote that the freedom to use technology 'independently' when studying needs to be considered [19]. Delayed use of technology was said to be one of the factors of the lack of digital literacy of students in Indonesia[20].This problem occurs in all genders, i.e. both men and women without exception. In addition, the results of the study also reported differences in digital literacy between men and women [21]. According toTran, et al, [22], andSarfo, Amartei, Adentwi&Brefowanita[23], women were more skilled at finding information using ICT, but men are superior in the use of ICT than in terms of finding information. Even though the level of digital literacy skills and skills is expected in all students.

Education evenly open to students could be an effort for quality human development to support the development of the nation evenly[24]. In supporting efforts to equalize education and ensure the quality of education, cooperation needs to be done from various parties such as improving various main facilities and supporters so that the education process can run well and optimally as expected. Various factors that can support efforts to equalize education in Indonesia, especially digital literacy such as paying attention to the quality of teachers, reviewing the level of education of students in each generation and the influence of gender on digital literacy. It is also in accordance with the SDGs (Sustainable Development Goals) of Quality Education, ensuring an inclusive and equitable quality of education and increasing lifelong learning opportunities for all students[6], [16]. In a sense, education is not only for some students in urban areas, but for all students evenly throughout Indonesia, such as rural areas.

Based on the description that has been explained both from the problems that occur in the field and the desired expectations, then by paying attention to the advantages of digital literacy, then before a movement is carried out to improve and develop the quality of digital literacy education of students, a preliminary analysis and a needs analysis of the initial profile of digital literacy of students and teachers in underdeveloped areas. The purpose of this study is to find out the initial profile of digital literacy of students and teachers, by compiling between schools, classes, and gender. The comparison of schools, classes, and gender in areas that are newly out of underdeveloped and remote areas is still lacking to be studied, so it needs to be studied further. The results of this study can be the basis in mapping the digital literacy of students and teachers and become the basis in developing a solution that is really appropriate and effective in empowering students' digital literacy in underdeveloped areas and areas that are just out of the underdeveloped areas.

2. Method

Type of the Study
This study was concurrent triangulation which combines qualitative and quantitative research in a balanced manner[25]. This study aims to find out the initial profile of digital literacy skill of students based on difference school, class, and gender. In addition, this study also aimed to obtain an overview of the digital literacy profile of teachers in underdeveloped areas. The results of this research could be the basis in mapping the digital literacy of students and teachers and the basis in developing an appropriate and effective solution in empowering the digital literacy of students in underdeveloped areas in Indonesia and internationally.

Sample
The research sample was students and teachers from state Junior High School (JHS) in underdeveloped areas in Jeneponto District, Indonesia. The selected schools of 15 state junior high schools, 450 students and 100 teachers in Jeneponto Distric (districts that just came out of the underdeveloped and remote zone in Indonesia in 2019) were selected by purposive sampling. Purposive sampling techniques were selected to determine rural and urban schools in Jeneponto. The study sample was described in detail in Table 1.

Table 1: Research Sample

Indicator	Number of students		Number of teachers	
Gender	Woman	237	Woman	63
	Man	213	Man	37
Class	Class VII	150		
	Class VIII	150		
	Class IX	150		
Age	12-13 Years	239	28-33 Years	56
	14-15 Years	211	34-40 Years	44

The location of research sample schools were visualized by the Figure 1 and determined the urban and rural area.
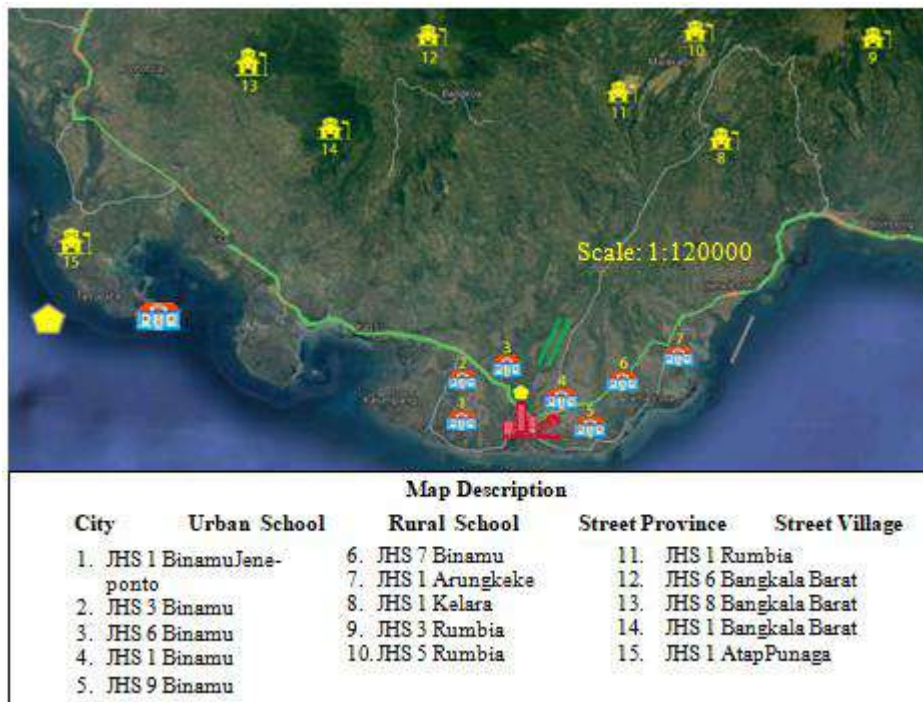
Figure 1: Demographic Map of Schools in Kab. Jeneponto in Urban and Rural Areas

Instruments of the Study

Digital literacy instruments of students and teachers use modified instruments fromNg [26] and Greenstein [27]whose indicators consist of 1) finding information, 2) using various sources of information, 3) selecting information, 4) evaluating information, 5) considering the source and effect of information messages, and 6) using information to produce original work. The digital literacy assessment category is at intervals of 4.00-3.20 (Exemplary), 3.19-2.80 (Expert), 2.79-2.40 (Basic) and below from 2.40 (Beginner).

Data Collection and Data Analysis

Data collection used in-depth interviews, questionnaires and documentation. Interviews to explore information from students and teachers about expectations about digital literacy (45 students and 30 teachers randomly selected from the school in urban and rural area), questionnaires were used to measure the level of digital literacy skill of students and digital literacy teachers, as well as documentation techniques used to review supporting documents that were in association with the level of digital literacy of students and teachers in underdeveloped areas. To produce a strong interpretation of data, data validation is performed by combining interview results, questionnaires and documentation [28]. Data analysis consisted of three stages, namely data reduction, data presentation, and conclusion/verification withdrawal. In addition, descriptive and inferential data analysis (t-test and Annova test) was also carried out to produce more accurate data.

3. Results

The results of study showed that the average score of digital literacy skill ofthe total number of students sample inunderdeveloped areas in Jeneponto District was in the beginners (schools in urban and rural area). In general, digital literacy indicator in finding information was the most accessible digital literacy for students, but digital literacy skill indicator in using information to produce an original work was still very low. The average score of digital literacy of students in urban and rural area in Jeneponto can be seen in Table 2.

Table 2: Average digital literacy of students in Jeneponto school based on indicators in urban and rural areas

School	N	Area	Digital Literacy Indicators						Average	Category
			1	2	3	4	5	6		
JHS 6 Binamu	30	Urban	2.73	2.63	2.6	2.67	2.67	2.4	2.62	Basic
JHS 1 Binamu	30	Urban	2.86	2.67	2.7	2.7	2.77	2.4	2.68	Basic
JHS 1 Binamu Jeneponto	30	Urban	2.69	2.62	2.49	2.43	2.53	2.33	2.52	Basic
JHS 3 Binamu	30	Urban	2.69	2.59	2.56	2.49	2.46	2.37	2.53	Basic
JHS 9 Binamu	30	Urban	2.61	2.57	2.57	2.57	2.57	2.57	2.58	Basic
JHS 7 Binamu	30	Urban	2.31	2.5	2.5	2.43	2.5	1.91	2.36	Beginner
JHS 1 Arungkeke	27	Urban	2.78	2.63	2.56	2.59	2.67	2.7	2.66	Basic
Average			2.67	2.60	2.57	2.55	2.60	2.38	2.56	Basic
JHS 3 Rumbia	30	Rural	2.32	2.2	2.1	2.2	2.1	2.17	2.18	Beginner
JHS 8 West Bangkala	30	Rural	2.32	2.27	2.19	2.17	2.12	2.02	2.18	Beginner
JHS 1 Atap Punaga	30	Rural	2.39	2.31	2.29	2.23	2.18	1.96	2.23	Beginner
JHS 6 Bangkala Barat	30	Rural	2.66	2.52	2.27	2.24	2.21	2.23	2.36	Beginner
JHS 4 Kelara	30	Rural	2.31	2.27	2.23	2.19	2.17	2.08	2.21	Beginner

JHS 1 Rumbia	33	Rural	2.33	2.24	2.18	2.12	2.04	1.89	2.13	Beginner
JHS 1 Bangkala Barat	30	Rural	2.31	2.21	2.19	2.15	2.11	1.87	2.14	Beginner
JHS 5 Rumbia	30	Rural	2.43	2.37	2.2	2.27	2.3	2.23	2.30	Beginner
Average			2.38	2.30	2.21	2.20	2.15	2.06	2.22	Beginner

Indicator Notes:
1. Find information
2. Using various sources of information
3. Select information
4. Evaluating information
5. Consider the source and effect of informational messages, and
6. Use information to produce original work

Furthermore, the results of the t-test of digital literacy of students in urban and rural areas showed a significant difference(p <0.05, where p = 0.000). These results shows that there were differences in the digital literacy skill of students in urban and rural areas that can be seen in Table 3.

Table 3: Results of t-test of Digital Literacy Test of StudentsonUrban and Rural Area

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Literacy	Equal variances assumed	274.084	0	10.803	448	0
Digital	Equal variances not assumed			10.322	300.142	0

The level of digital literacy of students in different classes shows that higher-level classes have better digital literacy skills than lower classes. It is also seen that the digital literacy of students dominates in indicators of finding information compared to other digital literacy indicators. The average level of digital literacy of students based on different class levels can be seen in Table 4.

Table 4: Average Score of Digital Literacy Level of Students based on Different Classes

Class	N	Digital Literacy Indicators						Average	Category
		1	2	3	4	5	6		
Class VII	150	2.59	2.47	2.28	2.11	1.97	1.82	2.21	Beginner
Class VIII	150	2.64	2.62	2.32	2.29	2.18	2.09	2.36	Beginner
Class IX	150	2.98	2.71	2.60	2.58	2.32	2.26	2.58	Basic

Table 5 shows that based on the results of one-way ANOVA tests at different class levels to digital literacy, the significance value obtained is p = 0.000 (p <0.05) which shows that there were differences in digital literacy of students in different classes.

Table 5: Results of Anova Test of the Digital Literacy of Students based on Different Classes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.960	2	4.980	39.299	.000
Within Groups	56.643	447	.127		
Total	66.603	449			

The level of digital literacy of students of different genders indicates that men have better digital literacy skills than women. It is seen that the digital literacy of male students outperformed on all indicators, except indicator 1. The average level of digital literacy of students based on gender can be seen in Table 6.

Table 6: Average Score of Digital Literacy of Students based on Different Gender

Gender	N	Digital Literacy Indicators						Average	Category
		1	2	3	4	5	6		
Man	237	2.63	2.60	2.59	2.36	2.23	2.21	2.44	Basic
Woman	213	2.66	2.53	2.24	2.27	2.16	2.06	2.32	Beginner

Furthermore, the results of the t-test of digital literacy of students on gender showed a significant difference(p <0.05, where p = 0.001). These results show that there were the differences in students' digital literacy based in different gender that can be seen in Table 7.

Table 7: Results of t-test of the Digital Literacy based on Different Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Digital Literacy	Equal variances assumed	35.518	.000	3.233	448	.001
	Equal variances not assumed			3.259	447.006	.001

The results of the averageteacher's digital literation of the study in underdeveloped areas in Jeneponto showed in the basic category. The average digital literacy score of teachers in urban and rural area in Jeneponto can be seen in Table 8.

Table 8: Average Score Digital Literacy of The Teachers based on Indicators in Urban and Rural areas

School	N	Area	Digital Literacy Indicators						Average	Category
			1	2	3	4	5	6		
JHS 6 Binamu	7	Urban	3.34	3.12	3.04	2.72	2.71	2.51	2.91	Expert
JHS 1 Binamu	6	Urban	3.21	3.19	3.01	2.76	2.7	2.45	2.89	Expert
JHS 1 Binamu Jeneponto	6	Urban	3.17	3.02	2.92	2.65	2.71	2.62	2.85	Expert
JHS 3 Binamu	6	Urban	3.22	3.06	2.91	2.72	2.76	2.48	2.86	Expert
JHS 9 Binamu	7	Urban	3.31	3.1	2.91	2.73	2.76	2.46	2.88	Expert
JHS 7 Binamu	6	Urban	2.91	2.86	2.52	2.43	2.32	1.87	2.49	Basic
JHS 1 Arungkeke	8	Urban	3.22	3.11	2.91	2.68	2.71	2.71	2.89	Expert

Average			3.20	3.07	2.89	2.67	2.67	2.44	2.82	Expert
JHS 3 Rumbia	6	Rural	3.16	3.06	2.98	2.51	2.43	2.23	2.73	Basic
JHS 8 West Bangkala	6	Rural	3.02	2.89	2.83	2.67	2.61	2.11	2.69	Basic
JHS 1 Atap Punaga	8	Rural	2.98	2.81	2.74	2.17	2.13	2.03	2.48	Basic
JHS 6 Bangkala Barat	7	Rural	2.99	2.84	2.73	2.23	2.13	2.07	2.77	Basic
JHS 4 Kelara	6	Rural	3.26	3.01	2.85	2.45	2.71	2.34	2.77	Basic
JHS 1 Rumbia	8	Rural	3.01	2.91	2.85	2.61	2.23	2.17	2.63	Basic
JHS 1 Bangkala Barat	7	Rural	2.97	2.81	2.74	2.45	2.15	1.74	2.48	Basic
JHS 5 Rumbia	7	Rural	3.06	2.88	2.76	2.56	2.39	2.23	2.65	Basic
Average			3.06	2.90	2.81	2.46	2.35	2.12	2.65	Basic

Furthermore, the results of the t-test of digital literacy of students on gender showed significant differences($p < 0.05$, where $p = 0.004$). These results show that there were differences in students' digital literacy in gender that can be seen in Table 9.

Table 9: Results of t-test of Teachers' Digital Literacy Skill in Urban and Rural Areas

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Digital Literacy Teacher	Equal variances assumed	16.306	.000	2.936	98	.004
	Equal variances not assumed			2.991	97.523	.004

The results of research in in-depth interviews with students and teachers in urban and rural areas in Jeneponto showed that there were some expectations from students and teachers. The results of the in-depth interview were coded and then became a summary that can be seen in Table 10.

Table 10: Summary of interviews on the expectations of students and teachers towards the formation of digital literacy in Kab. Jeneponto

Subject	Hope
Students	Socialization of good internet use in learning **
	The use of technology during the learning process**
	Deliver technology-based tasks while at home*
	"Internet" technology networks that are easily accessible in underdeveloped areas**
	There is a computer that can be used **
	The learning process focuses more on students using ICT*
	Learning process that makes students unsaturated in learning to use ICT*
Teachers	Integration of technology-based curriculum */**
	Equalization of internet network **
	ICT competency workshop */**
	Presenting the right technology-based learning process **
	Need reflection after the learning process when using ICT*/**
	Presenting technology-based LKPD that can always enable students in learning *
	Presenting a computer device in learning at all times **
	Presenting a school environment that is literate of technology *
	A learning process that focuses on developing and cultivating a loving attitude towards the right facts in digital literacy*

Note
*   Urban
** Rural

4. Discussion

The results showed that there were different results on each indicator of digital literacy of students. The score of students' skills and researchers in finding information is higher than other indicators such as skilled in using various sources of information, choosing relevant sources of information, evaluating information with the truth of the source, and being able to consider the source and effect of the message, and using information to create an original product. The results are in line with the results of a study drew & Forbes[13] and Mudra [29] which said, the earliest and easiest indicator of digital literacy is the ability to find information. In addition, the difference in location in the area in Jeneponto became one of the factors of low digital literacy of students and teachers.

The demographics of the school's location exerted a significant influence on a person's literacy level[30]. The level of digital literacy of students and teachers in urban areas was better than rural areas [31]. But in general, the average literacy level of students and teachers was still in the categories of "beginner" and "basic" (a combination of urban and rural schools). These results shows that the digital literacy of students and teachers in Jeneponto who just came out of the underdeveloped zone in 2019 still needs to be well empowered. According to Sarfo, et al. [23], the position of the region determined the level of digital literacy of a person, the more urban a location, the higher the level of digital literacy. Ease of accessing infrastructure and networking facilities was one of the factors of a person's high digital literacy in urban area [32]. In addition, modern lifestyle factors as well as the faster spread of information in urban areas are among the caused of a person's high digital literacy [33].

The level of digital literacy of students is also influenced by teacher factors. It seen in every school, the level of digital literacy of students and teachers is always in harmony. This proves that the high and low digital literacy of students can also be caused by the basic skills possessed by an teacher both in teaching and directing in school. According to Esteve-Mon, Llopis, &Adell-Segura [34], teacher as role models in empowering digital literacy in schools must be skilled to facilitate the transfer of information to their students. This was directly proportional to some studies, that the contribution of teachers was as a driver to students in awakening, managing, maintaining and channeling behavior in order to achieve patterns in accessing, stringing, understanding, and disseminating information in accordance with digital literacy skills[3], [35].

According to Liza &Adriyanti[5], digital technology had spread to all levels of education in Indonesia but most have not been able to use the technology properly, one of which is in underdeveloped areas or has been in the zone. Improper and correct use of technology can have "adverse" effects on individual and social survival [14]. Therefore, the main purpose of digital literacy should be expanded in order to educate the personality of the nation [10], [33]. Knowledge in discovering, evaluating, using, creating information and utilizing it wisely, healthy, intelligent, careful, precise and law-abiding to digital media could be expanded so that digital literacy skills both inside school and outside the school can run well [3], [36].

In addition, class level factors also have an influence in the mastery of digital literacy of students. In the results of the study, there was a significant association between different classes (classes VII, VIII and IX). The higher classes look more skilled in their mastery of digital literacy. According to Jan [18], higher levels of education had an influence in the skill of a person's digital literacy. Mindset, psychological and imperative factors of a learner in self-learning using ICT were also one of the causes of high digital literacy [37].Psycholgic and the development of students around the age of 12-15 years in the process of development so it was important to always be given guidance and enlightenment so that students are always literate digital literacy but still able to sort out things that should be done and avoided [38]. According to Bahri, Palennari, Hardianto Muharni & Arifuddin [39]Jamaluddin, Zubaidah, Mahanal & Gofur[40], the positive attitude of students would form well when teachers are able to provide reinforcement and good examples during the learning process.

In addition, the mindset and trust of families in providing access to information using gadgets in learning at a more mature age was one factor in the high digital literacy of students[23].In accordance with the results of the interview, in some cultures in Jeneponto societygadgets can only be used when the age has entered 12 years and above with restricted conditions.

According toKuputri [41], delayed use of technology was said to be one factor in the lack of digital literacy of students such as in Jeneponto. Freedom of self-exploration of information in the "virtual world/ internet" is one of the main factors in the presence of digital literacy [6], [12], [13].

In gender research on digital literacy of students, it was found that gender differences have different influences in the high level of digital literacy of students. Women have lower digital literacy than men. It appears that women are only able to outperform men in terms of finding information, but lose in other indicators. According toTran, et al. [22], women had rigor and foresight in finding information and filtering out existing information, while men are skilled in the use of technology. Local cultural factors that give women greater freedom of access to technology than women are the cause of men's high digital literacy. This is in line with the findings of research from STEM, which identified that emotional and cultural barriers were the obstacles women face in achieving equality of technology, especially in rural areas of the world that still hold hereditary customs [23].

According to Norte, Negreiros&Correia[42], Mudra [29] andHazar[43], if someone want to empower digital literacy well, then motivating, collaborating together is the right way to improve digital literacy. Curriculum integration is also important to be done in the education system in a school so that the digital literacy of students and teachers can run well. This finding is in line with [13], that curriculum could be a director to everyone in the school unit in bejahar and teach together. In addition, in practice in underdeveloped areas, teachers should overcome existing shortcomings with learning reflection and present a pleasant learning process so that social systems and reaction principles can be achieved[44].

The expectations of students and teachers in urban and rural areas are also slightly different from the formation of digital literacy. It is seen that the expectations of students and teachers in urban areas focus on developing existing digital literacy basically, but in rural areas, the hope of "technology procurement" becomes the thing that is expected to be done. Presenting digital literacy students in a limited area (areas that have been left behind in terms of technological devices) can be done by cultivating and arousing love and a sense of belonging to facts, truth and science when using ICT [45].In general, the expectations that students and teachers in areas that have just come out of the underdeveloped zone are the attention of the education world to pay attention to digital literacy.

5. Conclusion

Digital literacy of students and teachers in areas that have felt the zone of underdeveloped and remote areas is still classified as beginner and basic. It seen in urban areas had digital literacy skills were slightly better compared to rural areas. In addition, differences in class and gender levels have a significant influence onthe digital literacy skill ofstudents,where higherclasses were better at empowering digital literacy, and men have better skills than women to digital literacy. The expectations of students and teachers in urban and rural areas were also different, urban areas expected to the development of digital literacy skills that have existed in a person before, while rural areas expected to the procurement of technology in their schools. In general, the empowerment of digital literacy of students and teachers

needs to be empowered to the maximum so that equitable distribution of education in Indonesia can be achieved.

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