Exploring the Digital Literacy Profile: A Closer Look Based on Gender

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Abstract. Digital literacy is one of the skills that students must learn in digital era. Digital literacy requires students to develop various skills such as the ability to find and create content, solve problems, and communicate online effectively. However, the digital literacy of students in Indonesia is still relatively low. It can be seen that students are only digitally literate. One of the factors that influence digital literacy is gender differences. This study aimed to determine students' digital literacy skills based on gender. This research was a descriptive research with a survey method. The instrument used was a test developed based on digital literacy aspects and indicators previously modified by researchers. The sample of this research was 92 students from MTsN 1 Blitar City. Data were analyzed descriptively and inferentially with an independent sample t-test using SPSS 21. Results showed that the digital literacy profile of students was still low, in terms of gender, male students were slightly superior to female students. However, this difference was not significant based on the t-test hypothesis, which was there was no significant difference of digital literacy level between male and female students. It is recommended for further research to be based on geographical location of the school and develop solutions to overcome low digital literacy, such as development of Information and Communication Technology (ICT) based media.

Keywords: Gender, Digital Literacy, Student Profile

1   Introduction

Along with the rapid advancement of technology, the use of digital technology has become increasingly important in various areas of life, including education. In this digital era, students need to have digital literacy skills to compete in a future that is increasingly dependent on digital technology. Digital literacy has become an essential skill for individuals in the modern world. It involves the ability to understand, analyze, and use information from various sources through computer devices [1]. Developing digital literacy skills is essential for the 21st century because emerging technologies can be leveraged to advance skills in the school education environment [2]. Utilization and understanding of digital literacy need to be developed to foster student character values in the 21st century because students tend to be more interested in technology that can be used by teachers as a forum for channeling the development of character values and learning [3].

Digital literacy is a person's ability to use and utilize digital media to find or create information wisely and intelligently [4]. Digital literacy requires students to develop various skills such as the ability to find and create content, solve problems, and communicate online effectively [5]. Digital literacy involves not only the ability to use technology but also the ability to analyze and evaluate digital content [6]. Someone who is digitally literate is not only skilled in accessing technology but can filter various information contained in the media [7]. Skills, functional and critical knowledge are part of the digital literacy component [8].

Information and Communication Technology (ICT) in learning digital literacy has an impact on students, including helping students access digital information, supporting independent learning, creating new and creative learning environments, and improving the quality of learning delivered to students [9]. Digital literacy refers to skills necessary to use digital technology, including operational, information navigation, and creative skills [10]. Digital literacy in learning provides benefits to assist the learning process, to be able to distinguish learning resources that are correct, significant, and can provide benefits, and to open up opportunities for teachers to be more productive in creating digital teaching media [11].

In Indonesia, a movement was started in 2017 by the Ministry of Communication and Informatics in collaboration with many elements of civil society to develop a digital literacy framework as a guide for the development of the digital literacy movement in Indonesia [12]. In recent years, the importance of digital literacy in education has been recognized. Schools have started to focus on developing students' digital literacy skills as part of their curriculum. Thus, analyzing students' digital literacy profiles is very important to understand their skills and competencies. Education in Indonesia has challenges in how to design learning using digital media to improve the quality of teaching and the competence of students, especially digital literacy [13]. Students' digital literacy skills can be improved through learning activities that utilize multimedia and interactive materials [14]. The application of Schoology-based e-learning on impulse and momentum material can train digital literacy [15]. Digital literacy can be trained not only during learning at school but also at home, for example by choosing educational-based application sites and shows and parents facilitating supporting digital devices [4].

In Indonesia, the level of digital literacy is still relatively low, especially among junior high school students. In recent years, the government and educational institutions have attempted to increase students' digital literacy through training programs and developing digital skills. However, there is still a lack of understanding of students' digital literacy profiles, including digital skills and competencies possessed by students in Indonesia.

Previous study suggested that students' digital literacy abilities were in good category, but students still could not fully understand the use of good and optimal gadgets in learning [16]. The results of the research showed that the digital literacy abilities of students in Yogyakarta were at low level [17]. Teaching using technology-based media in learning is important but an understanding of digital literacy among prospective teachers was also still limited, thus it had an impact on teaching students, affecting their skills in [18]. Students have skills in using technology, but they need to develop skills in understanding the content of technology-based digital media contexts.

This can create positive social change because students will be better prepared to live and interact safely and efficiently in a digital-based society [19].

Based on observations, the majority of students could operate one type of digital devices, such as smartphones, compared to other digital devices such as laptops. Some students indicated that digital literacy skills had not been used to assist their learning activities. Students had difficulty using applications and platforms intended to support learning such as Google Meet and Google Classroom. Students still found it difficult to complete assignments even with the help of digital technology. Digital literacy of students in MTsN 1 Kota Blitar was found to be literate towards technological developments, in the sense that they had the ability and skills to use digital media in learning, but there was lack of awareness in utilizing digital media for the necessity of seeking educational information and they could not manage and understand the information obtained from digital media properly.

Factors affecting digital literacy including active use of online media, academic achievement, the role of parent or family-intensity reading, and digital literacy skills [20]. Digital literacy is influenced by several factors, such as technical skills, critical understanding, and communicative abilities. With critical understanding, students can comprehensively analyze and evaluate media content [21]. The learning curriculum also influences students' digital literacy skills [8]. One of the factors that influence students' digital literacy in Indonesia is the delay in the use of technology [22]. In addition, gender differences and school locations also affect students' digital literacy [23]. The results of the study also showed that there were differences in digital literacy between men and women [24]. Men were found to be better using ICT while women were more skilled in finding and searching for information using ICT [25,26]. The focus of this research was on students' digital skills and competencies. In this study, digital skills included the ability to use software, internet, and social media. Meanwhile, digital competence included the ability to search, evaluate, and use the information found on the internet.

Based on this description, the problem in the field was how is the level of digital literacy ability of junior high school students based on their gender. Thus, it is necessary to do research related to the level of digital literacy ability of junior high school students on each indicator. This research aimed to gain a better understanding on the digital literacy profile of junior high school students. Through this research, it is hoped that useful information can be found from this study to improve digital skills training and development programs in schools so students can improve their digital abilities and compete in increasingly advanced digital era. This research is expected to be able to make important contribution to the development of education in Indonesia.

2   Methods

2.1   Type of Study

This research was a quantitative research with survey method. This study aimed to determine the initial profile of students' digital literacy skills based on gender. The results of this research can be used as the basis for developing appropriate and effective solutions to increase students' digital literacy.

2.2   Sample

The research sample was MTsN 1 Blitar City students with a total sample of 92 students from 3 classes. The sample selection technique was purposive sampling. The purposive sampling technique was chosen based on certain considerations, for example by examining class averages, which were relatively similar in terms of learning achievement. The purpose of using purposive sampling was to find samples that match the criteria specifically determined by the researcher.

2.3   Research Instrument

The instrument used was a test with modified indicator aspects, the aspects examined in the test including internet searches, hypertext guides, evaluation of content and information, and compilation of knowledge [6,27,28,29]. The digital literacy level categories were evaluated as scores as presented in Table 1 [30].

Table 1. Categories of digital literacy levels

Score	Categories
4.00 – 3.20	Very High
3.19 – 2.80	High
2.79 – 2.40	Low
< 2.40	Very Low

2.4   Data Collection and Data Analysis

Collecting data was conducted by giving tests to students to work on. Then the results of the digital literacy test were then analyzed descriptively and statistically using independent sample t-test. Statistical analysis used SPSS software version 21. Independent-sample t-test was used to determine significant differences in digital literacy ability levels based on gender.

Hypotheses used for t-test were presented below (α=0.05);
Ho: There is no difference in digital literacy skills between men and women
H1: There are differences in digital literacy skills between men and women
If Sig (2-tailed) > ½ α, then Ho is accepted
If Sig (2-tailed) < ½ α, then Ho is rejected.

3   Results and Discussion

3.1   Research Sample

This research was conducted at MTsN 1 Blitar City with total sample of 92 students from grade 8 aged 13-15 years. Figure 1 showed the number of study participants based on gender. Participants consisted of 37 male (40.2%) and 55 female (59.8%) students. Participants were given multiple choice test based on aspects and indicators of digital literacy with a total of 13 questions.
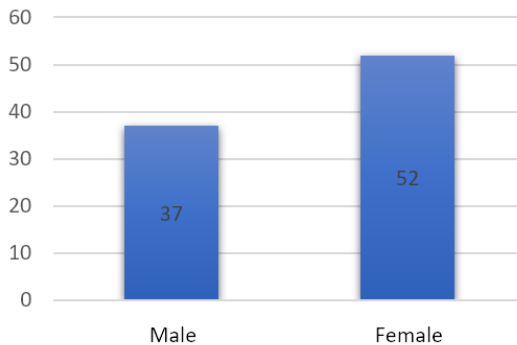

Fig. 1. Number of sample students

3.2   Digital Literacy of Students

Literacy is a fundamental skill that must be owned by anyone in the current digital era, especially students because it has an impact on their learning abilities [31]. People of all genders need to have adequate digital literacy skills, but study showed that a gender gap was found in digital literacy. In Indonesia, for example, women were found to have lower level of digital literacy compared to men. Students who used ICT in learning was found to have better learning outcomes than those who did not [32]. This is related to and has an impact on digital literacy in the current digital era.

Results showed that students' digital literacy was at a very low level based on the average results of students' digital literacy test scores. The internet information searching digital literacy aspect had the highest average score of 2.55. Meanwhile, the Hypertextual Navigation aspect had the lowest score, at 1.71. The results of the average scores and digital literacy levels of students is presented in Table 2. Table 2 shows the overall average for each aspect, standard deviation, and categories of students' digital literacy levels.

Table 2. Results of Students' Digital Literacy Scores and Categories

Aspects of digital literacy	Score	Category
Internet information searching	2.55 ± 0.776	Low
Hypertextual navigation	1.71 ±0.584	Very Low
Content evaluation	2.04 ±0.971	Very Low
Knowledge assembly	1.85 ±0.390	Very Low

Based on these results, the internet information searching aspect had higher score compared to other aspects, such as hypertextual navigation, content evaluation, and knowledge assembly. The indicators in the internet information searching aspect included compiling procedures for searching the internet effectively and efficiently and gathering information from the internet. Meanwhile, the hypertextual navigation aspect consisted of indicators using hypertext guides on the media. The content evaluation aspect consisted of indicators clarifying the validity and completeness of the content, and assessing the appropriateness of the information content. In the knowledge assembly aspect, there were also indicators of building knowledge and information content. Based on previous study, the initial and easiest aspect of digital literacy was the ability to search for information in the internet [33,34,35].

3.3   Digital Literacy of Students by Gender

The results of students' digital literacy levels by gender showed that male students had slightly better digital literacy skills than female students. This can be seen based on the average score of students' digital literacy in each aspect. The digital literacy aspect of male students was higher in all indicators. However, the difference in these results was not very significant based on average score. These results are in line with previous studies, which found that there was a small difference in male and female digital literacy [36,37]. The average results of students' digital literacy levels by gender is presented in Table 3.

Table 3. Average Level of Digital Literacy of Students by Gender

Gender	Digital Literacy Score				Average Score	Category
	Information Searching	Hypertextual Navigation	Content Evaluation	Knowledge Assembly		
Man	2.57	1.81	2.08	1.92	2.1	Very Low
Woman	2.55	1.64	2.02	1.80	2.0	Very Low

Gender difference is one of the factors that affect the level of students' digital literacy [38]. Based on data from the Ministry of Communication and Informatics and the Katadata Insight Center (KIC) for 2021, digital literacy of women was generally different from men. Digital literacy ability of men was higher than that of women. The factor that causes different digital literacy levels of women and men was that men were more likely to have better access to and use digital technology more frequently, which can improve their digital literacy skills. Men tended to be more interested in using technology and have different preferences for using digital technology, such as playing online games [39]. Several studies have shown that women tended to have lower self-perceptions about their digital literacy skills, which might influence their motivation to improve digital literacy skills [33].

The results of the independent sample t-test of digital literacy is presented in Table 4. Table 4 shows sig, t-values, degrees of freedom, and sig values. (2-tailed) of t-test. Results showed that there was no statistically significant difference in students' digital literacy between men and women. This was due to the results of the paired sample test

that the value of Sig (2-tailed) > 0.025, at 0.841, thus Ho is accepted, meaning that there was no significant difference in digital literacy skills between men and women.

Table 4. T-test Results of Independent Digital Literacy Samples by Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig	t	df	Sig. (2-tailed)	Mean Differences	std. Error Difference
Digital Literacy	Equal variances assumed	1.188	0.279	-206	90	0.837	-0.481	2.338
	Equal variances not assumed			-202	97	0.841	-0.481	2.386

Other research suggested that gender and age affected differences in digital literacy between men and women [41]. However, the results of this study were not in line with previous studies, which suggested that there were significant differences between men and women in digital literacy. In this study, no significant difference was found between male and female digital literacy. This is in line with other study which suggests that gender did not affect digital literacy [42,43]. This probably happened due to several factors, for example men and women using unfamiliar digital media, where the women were more limited. At school, all students are facilitated with computer and smartphone in labs equipped with wi-fi network. This can help students to learn digital literacy skills better, in line with the factors that affect digital literacy, such as social interaction and experiences or habits of using media [44]. Therefore, female and male students can have the same level of digital literacy. A number of studies also have examined gender differences in digital literacy, however the results were varied and the study characteristics and samples were not explained in details, thus the influencing factors were also not consistent [45].

4   Conclusion

The gender difference factor of digital literacy based on the indicators showed that male students had slightly higher level than female students. However, the results were not different significantly, thus gender differences did not have a significant effect on students' digital literacy skills. This is also possibly due to Indonesia has started to promote digital literacy in every school so that all students can practice their digital literacy. In general, students' digital literacy needs to be highly supported in this digital era, so that educational equity in Indonesia can be achieved.

5   Acknowledgments

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