

## Digital Literacy Ability towards Curiosity Level and Student Self-Determination

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**Abstract: Digital Literacy Ability towards Curiosity Level and Student Self-Determination** The purpose of this study was to analyze digital literacy skills on the level of curiosity and self-determination of students. This study uses a quantitative approach with statistical methods. The type of research used in this research is ex-post facto. The population in this study were students in Indonesia aged 17-22 years with a sample of 723 selected randomly. The instruments used are digital literacy measurement, the Curiosity measurement scale, and the self-determination measurement scale. Data analysis used statistical tests, namely the Mann-Whitney test and simple linear regression. The main result of this research is that there are differences in digital literacy and self-determination in terms of gender, but in the aspect of Curiosity there is no difference. Furthermore, there is a positive effect of digital literacy on curiosity and self-determination. The digital literacy prediction model for curiosity is  $Y=11.28+0.38X$  and the digital literacy prediction model for self-determination is  $Y=25.77+0.57X$ .

**Keywords:** curiosity, self-determination, digital literacy, college students.

**Abstrak: Kemampuan Literasi Digital terhadap Tingkat Curiosity dan Determinasi Mahasiswa.** Tujuan penelitian ini adalah menganalisis kemampuan literasi digital terhadap tingkat curiosity dan determinasi diri mahasiswa. Penelitian ini menggunakan pendekatan kuantitatif yang pengolahan datanya dilakukan dengan metode statistik. Jenis penelitian yang digunakan dalam penelitian ini adalah ex-post facto. Populasi dalam penelitian ini adalah mahasiswa di Indonesia dalam usia 17–22 tahun dengan sampel penelitian sebanyak 723 yang dipilih secara acak. Instrumen yang digunakan adalah digital literacy measurement, skala pengukuran Curiosity dan skala pengukuran determinasi diri. Analisis data menggunakan uji statistik yaitu uji Mann Whitney dan Regresi Linier Sederhana. Hasil utama dari penelitian ini adalah terdapat perbedaan literasi digital dan determinasi diri ditinjau dari jenis kelamin, tetapi dalam aspek Curiosity tidak ada perbedaan. Selanjutnya terdapat pengaruh positif literasi digital terhadap curiosity dan determinasi diri. Model prediksi literasi digital terhadap Curiosity adalah  $Y=11,28+0,38X$  dan model prediksi literasi digital terhadap determinasi diri adalah  $Y=25,77+0,57X$ .

**Kata kunci:** curiosity, determinasi diri, literasi digital, mahasiswa.

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## ■ INTRODUCTION

Nowadays the advances of information technology as internet has resulted in very abundant digital information resources (Kurnianingsih, Rosini & Ismiyati, 2017). But its development likened to two sides of a coin that has positive and negative effect. In Indonesia it has grown from year to year. The results of APJII (Association of Indonesian Internet Services Providers) survey stated that there was an increase in internet user in Indonesia in 2018, it increased until 10.12% with 27 million users from the previous year. It means, based on data from the Indonesia Central Statistics Agency (BPS) that there are 171.17 million internet users out of total of 246.16 million Indonesian people.

Gilster (1997) defined digital literacy as the ability to understand and use information from various digital sources. He stated that digital literacy is the ability to use technology and information from digital devices effectively and efficiently in various academic, career, and daily life contexts. Moreover, Digital literacy is an individual's interest, attitude, and communication tools to access, manage, integrate, analyze and evaluate information, build new knowledge, create, and communicate with others in order to participate effectively in society (Potter, 2005). Potter also emphasize that efforts to digitally-based society literacy means not only introducing digital media, but also synergizing thinking skills with daily activities that lead to increased productivity.

Digital literacy is not a new topic among students. Research conducted by Azmi (2006) at the University of Qatar shows that the ability to search for information in databases is considered one of important skills that student must possess. However, online skills, including searching for information on the internet, may differ among students (Santos, Azevedo, & Pedro, 2013). In Turkey, research by Bayrak &

Yurdugül, 2013) found that students in the use of information and communication technology. This is reinforced by the research of Kingsley and Kingsley (2009) which shows that although some students are unable to demonstrate the competence of website-based exams, demographic factors (gender, age and race) do not affect students' digital literacy competence. Moreover, Betaubun (2020) indicates that the digital competency of higher students is crucial skill to improvement.

Other factors that affect the level of digital literacy are computer ownership at home, language factors, Socio economic status, and duration of using a computer affecting one's digital skills (Norishah, *et al*, 2012; Jara, *et al*, 2015). However, Ivankoviæ, piranec & Miljko (2013) indicates that the duration of using computer cannot be used as a predictor of digital literacy numbers when the majority of students use computers only to surf the internet.

In essence, the digital literacy is a digital media-based learning effort, where there is merger of two sciences, namely education technology. In reality it is very difficult to implement, this is due to the lack of student interest in using digital platforms in the learning process. In fact, the current situation demands technology-based learning, namely technology to find sources of information. Literacy encourages individuals to have high curiosity and determination towards the challenges of student studies. Curiosity is a basic component of human nature that is almost not realized of magnitude of its use for human survival. Actually, the curiosity is the desire to gain knowledge and experience through interest, novelty seeking, openness of experiences through exploration (Peterson & Seligman, 2004).

Various studies and previous research results prove that curiosity is very important for human life so that it needs to be developed including in learning because it can meet

intellectual needs, expand knowledge, advance civilization, understand the world, and fulfill the growth and development of students' knowledge. Furthermore, Curiosity in students in learning really needs to be developed so that educational processes and goals can be achieved in accordance with expectations (Hogan & Greenberger, 1969). While the determination is a person's ability to have a constant act of changing cognitive and behavior to bring up pleasant decision choices, bringing benefits to himself and obtaining flexible accommodation from the social environment and being influenced by a person's sense of "self" (O'Connor & Vallerand, 1994). In the context of life in college, students who have high self-determination will show behaviors such as: perseverance and persistence in achieving goals, enjoying academic assignments more, higher self-satisfaction, commitment to their actions, and harmonious relationships with lecturers or friends and shows higher conceptual knowledge (Wichmann, 2011).

Research by Deci, et al, (1991) found that students who have low self-determination will show behaviors such as: skipping class, bored in studying, lazy to do assignments, lack of motivation, feeling helpless, self-indulgent, self-deprecating, often think negatively and depend on others and are not adequately self-motivated (Lynch, Vansteenkiste & Ryan, 2010). So that the influence of curiosity and self determination of students has an attachment to digital literacy abilities.

## ■ METHODS

### Participant

The population in this study are students in Indonesia aged 17-22 years. However, the research subjects used a simple random sampling technique obtained from distributing questionnaires randomly to students at various

universities in Indonesia and obtained 723 participants.

### Research Design and Procedures

This study uses a quantitative approach with ex-post facto type. the researcher tries to take the effects of the dependent variable and examine it retrospectively to establish causes, relationships, associations, or meanings (Cohen, Manion & Morrison, 2007). In ex-post facto research, researchers cannot manipulate variables. Researchers only describe what happened to the independent variable and seek information about the causal relationship of events. In general, this research was carried out in several steps. First, Defining, researchers conducted studies related to digital literacy, curiosity and self-determination to determine appropriate indicators related to these variables. Second, Measuring, distributing digital literacy, curiosity and self-determination questionnaires to students at various universities in Indonesia with Google Form. Third, Analyzing, the researcher analyzes the data obtained by using the appropriate statistical test.

### Instruments

To measure the level of digital literacy, a digital literacy questionnaire was used which was developed based on the eight essential elements proposed by Douglas A.J. Belshaw in his thesis What is 'Digital Literacy'? In 2011 (Kemdikbud, 2017). The eight elements of digital literacy include: cultural, cognitive, constructive, communicative, self-confident, creative, critical, and socially responsible.

The indicators used in the digital literacy questionnaire are these eight elements with the number of questions: cultural there are 4 questions; cognitive there are 3 questions; constructive there are 4 questions; communicative there are 3 questions, there are 3 questions self-confident; creative there are 4 questions;

critical there are 5 questions, and socially responsible there are 2 questions. So for the digital literacy questionnaire, there are 28 questions.

Then, to measure Curiosity this study uses the Curiosity measurement scale that consists of three indicators of novelty seeking, openness of experience and exploration (Peterson & Seligman, 2004). Novelty seeking there are 8 questions; openness of experience there are 4 questions; and exploration there are 4 questions. So for the curiosity measurement scale, there are 16 questions.

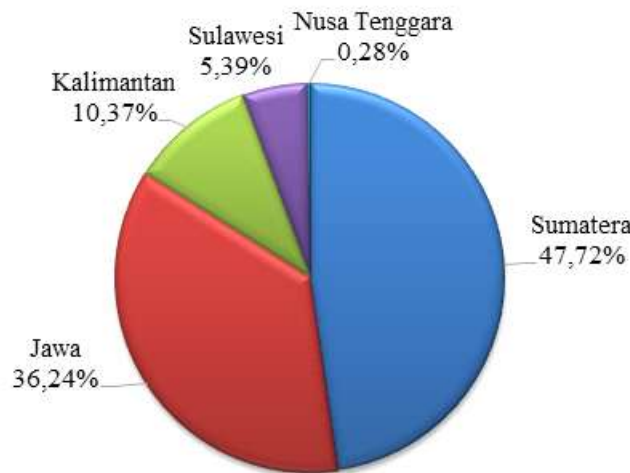
Meanwhile, to measure self-determination, this study use a self-determination measurement scale which is developed based on three components adapting from Richard & Edward (2017), namely (1) Perseverance and persistence in achieving goals, there are 5 questions; (2) Enjoy academic work more, there are 9 questions; (3) Higher self-satisfaction, there are 5 questions; (4) Committed to his actions, there are 5 questions; (5) Harmonious relationship with lecturers or friends and demonstrates higher conceptual knowledge, there are 5 questions. So

for the self-determination measurement scale, there are 29 questions.

Prior to data collection, all questionnaires were validated by several experts at the University of Lampung, then the questionnaire was tested on 100 students at the University of Lampung, then analyzed which questions were appropriate and which were not. Based on these validations and trials, the questions used in this study were 28 for digital literacy, 13 for curiosity, and 22 for self-determination.

## ■ RESULTS AND DISCUSSION

Based on the developed instrument that has been carried out, there are three main instruments, namely Digital Literacy Measurement, Curiosity Scale and Self-Determination Scale. Before the instrument is used to search data collection. This instrument is tested to figure out the suitability of the items on the instrument and the level reliability. Furthermore, the instrument is tested on 100 respondents of students of University of Lampung. Based on the test results obtained items that are appropriate and fulfilled reliability so that it can be used to retrieve research data.



**Figure 1.** Distribution of students who became respondents by island

When it is viewed in term of age. The students who become respondents were in the range of 17-22 years old. It also describes the gender of respondent that consist of 188 male and 535 female students. It means the proportion of female is more than male respondents. Beside that, for the learning resources used by students, most of the student namely 688 students or 95.7% used internet and e-book as their resources of learning process, and only 31 or 4.3% students used paper book as their learning resources.

In digital literacy data, the highest score given by the respondent is 136 out of a maximum score of 140 and the lowest score is 60 out of a minimum score of 28. Furthermore, if grouped into three categories into high, medium, and low with the score interval formula according to Raharjo and Winarko (2021), then obtained the interval score of 28-65 is a low category, 66-103 medium category, and 104-140 high category.

Based on the grouping, it is known that 2 people are in a low category (0.28%), 152 people

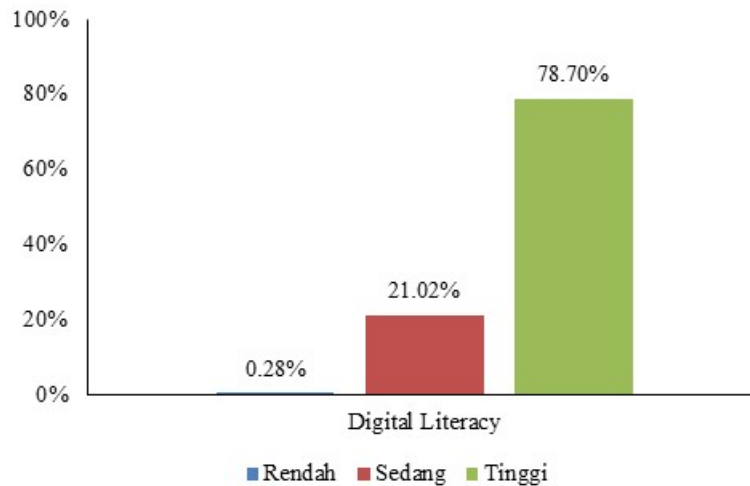


Figure 2. Digital literacy category. Low, middle, and high level showed by blue, red, and

are in the medium category (21.02%) and 569 people are in the high category (78.70%). This means that most of the respondents are at a high level of Digital Literacy.

Based on research data, most of the respondents are familiar with the internet, e-books, and similar things which strongly support and reflect some form of technology or digital media used for learning. This means that most respondents who come from several islands in Indonesia are already using digital technology. Furthermore, when viewed from the percentage, most of the respondents are in the high category

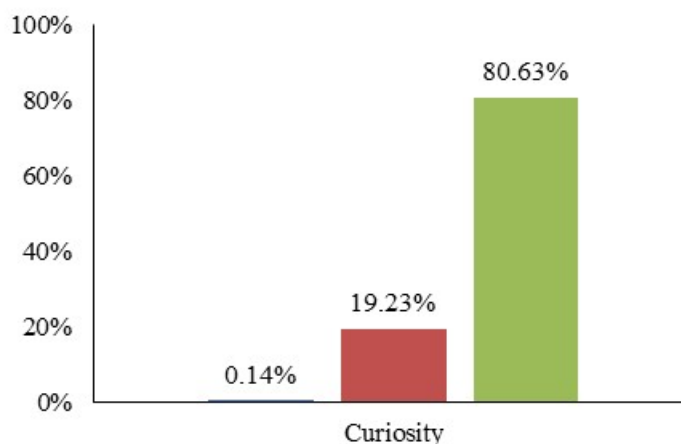
for their Digital Literacy, especially Digital Literacy related to learning. This indicates that most students are able to take advantage of various digital media and learning resources that can be accessed using the internet. This is in line with the research by Limilia & Aristi (2019) where most of the people with different backgrounds have different media and digital literacy skills, but in general they already have good access skills. However, for students, it is necessary to carry out further examination regarding what sites or pages are used to assist the learning process, this is quite important considering the results of

research from Nurdin (2015) in Palu City that although the use of the Internet for access to lecture information is quite high, but there are still a few students who use the scientific search engine on Google Scholar (Google Scholar). Whereas Google Scholar is a service that allows one to search for subject matter in the form of text in various publication formats.

Then, it is examined to know how digital literacy is in term of gender. Based on the Mann-Whitney test using the JASP application, the value of  $p = 0.002 < 0.05$  means that there is a difference in the average Digital Literacy ability in terms of gender. It is also known that the Female Mean value is 112.456 while the Male Mean value is 109.473. This means that female students is higher than male students. This is in line with Akbar & Anggaraeni's research (2017) that female students outperform the digital literacy of male students. In contrast to the research by Rodiah & Sopandi (2021) which concluded that although there were differences in interest in online learning between male and female students, the digital literacy skills of male and female students during online learning did not show a significant

difference. This could be because the Digital Literacy indicators used are in different contexts. In this study, the statements made were related to the context of online learning and the use of online learning resources and related to Curiosity and self-determination. In addition, in this study, the proportion of male students is far less than female, while in Rodiah & Sopandi's (2021) research, it is almost balanced and focuses on elementary school students. In another study, the difference in Digital Literacy between men and women is more in the interest in using the device, the men are more interested in hardware and programming, while women prefer standard software and Internet applications (Ertl & Helling, 2012).

In Curiosity data, the highest score given by the respondent is 65 out of a maximum score of 65 and the lowest score is 20 out of a minimum score of 13. Furthermore, if grouped into three categories high, medium, and low using the same formula. The intervals obtained are 13–30 in the low category, the interval 31–48 in the medium category, and the interval from 49–65 in the high category.

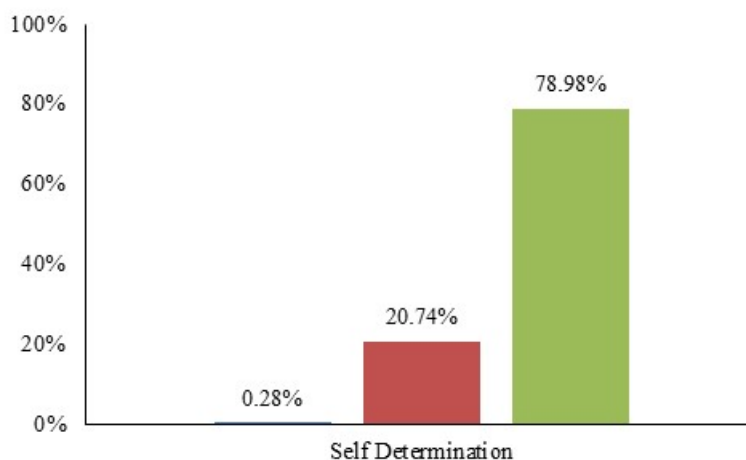


**Figure 3.** Curiosity category. Low, middle, and high level showed by blue, red, and green.

Based on these categories, data was obtained from 1 person in the low category (0.14%), 139 people in the medium category (19.23%), and 583 people in the high category (80.63%). Based on these data, it is known that most of the respondents are high for Curiosity, which is more than 50%. Furthermore, it is seen by gender by conducting a test using the JASP application with the Mann-Whitney test. Based on the Mann-Whitney test, the value of  $p = 0.194 > 0.05$  means that there is no difference in the average Curiosity ability in terms of gender. Although it appears that the male mean, which is 188, is smaller than the female mean, which is 535. This supports research from Raharja, Wibhawa & Lukas (2018) which states that there

is no difference in the average curiosity (Curiosity) of women and men, although the focus is on school students. However, it is different from Nugroho's research (2019) that there is no significant difference in curiosity between boys and girls, and the study used a proportional sample between boys and girls, namely 50 boys and 50 girls.

In Self-Determination data, the highest score given by the respondent is 110 out of a maximum score of 110 and the lowest value is 40 out of a minimum score of 22. Furthermore, if grouped into three categories high, medium, and low then the interval is 22–51 low category, interval 52–81 medium category, and 82–110 high category.



**Figure 4.** Self determination category. Low, middle, and high level showed by blue, red, and green.

For the low category, there are 2 people (0.28%), the medium category is 150 people (20.74%) and the high category is 571 people (78.98%). Based on these data, it is known that most of the respondents are of high self-determination, which is more than 50%. Furthermore, the test was carried out using the JASP application with the Mann-Whitney test. The results of the test on Self-Determination data and it is known that the value of  $p = 0.004 < 0.05$  means that there is a difference in the average

ability of Self-Determination in terms of gender. Furthermore, the female mean is 90,439 more than the male mean, which is 87,941. These results are in accordance with the research of Nilamsari, Sugara, & Sulistiana (2020), with a focus on adolescents. According to his research, male students tend to have a narrow understanding of the learning process. Male students do not use learning as an opportunity to get something, such as a job. Meanwhile, women can easily understand these opportunities. However,

Emmiyati's research (2017) explains that there is no significant difference between male and female self-determination.

So, the collected data is analyzed using the Simple Linear Regression statistical test, to find out the predictions of Digital Literacy on Self-determination and predictions of digital literacy on curiosity. After fulfilling the classical assumptions, a linear regression test is performed using JASP application and the following ANOVA table is generated. Obtained the value of  $\text{sig} = 0.000$ , it means that digital literacy has a significant influence on curiosity. Furthermore, based on the calculations obtained  $R^2 = 0.36$  or 36% it means that digital literacy can contribute 36% to curiosity. A regression equation can be formed, namely  $Y = 11.28 + 0.38X$  where Y is the value for curiosity and X is the value for digital literacy. So, to predict the size of curiosity seen from digital literacy, you can use this equation.

From the statistical test, it was concluded that Digital Literacy had a positive and significant influence on Curiosity. This means that the higher the student's Digital Literacy, the higher the Curiosity they have. It can also be predicted using a linear regression model that is formed, namely  $Y = 11.28 + 0.38X$  or  $\text{Curiosity} = 11.28 + 0.38 * \text{Digital Literacy}$ , so that when a student's Digital Literacy ability is measured, Curiosity can also be predicted. This influence can be because students with high digital literacy skills will certainly be able to run or manage digital devices, not only on their devices but also from the information or content in them. For example, if in terms of the device, when there is a new device or application as needed, it will direct students to try to operate it until they can, Curiosity will appear here. In other cases, for example in terms of information received by students from digital media, they will certainly ensure the truth of the information, this also raises student Curiosity. It turns out that this is also in accordance with the statement of Hague

& Payton (2011) that in the context of education, good digital literacy will play a role in developing one's knowledge about certain materials by encouraging curiosity and creativity. Moreover, according to Muslimin & Eid (2020) currently students use digital applications more to obtain useful information, including carrying out online teaching and learning activities.

Digital Literacy and Self-Determination were also analyzed using the SPSS application. Obtained the value of  $\text{Sig.} = 0.000$  means that Digital Literacy has a significant influence on Self-Determination. In addition, it is known that  $R^2$  shows the number 0.35 or 35%, meaning that Digital Literacy can contribute 35% to Self-Determination. The regression equation formed is  $Y = 25.77 + 0.57X$  where Y is the value for Self-Determination and X is the value for Digital Literacy. So to predict the amount of Self-Determination seen from Digital Literacy, you can use this equation.

From the statistical test, it was concluded that Digital Literacy had a positive and significant influence on self-determination. It means that the higher the student's Digital Literacy, the higher their self-determination. It can also be predicted using a linear regression model that is formed, namely  $Y = 25.77 + 0.57X$  or  $\text{Self-Determination} = 25.77 + 0.57 * \text{Digital Literacy}$ , so that when a student's digital literacy ability is measured, their Self-determination can also be predicted.

High and good digital literacy skills, especially in learning, certainly make students able to take advantage of various digital devices and media to obtain various information needed and can be done easily. Communication with other people, especially for discussion, is also easier even though they are in different and far apart locations. This will be related to one's self-determination as explained by O'Connor & Vallerand (1994) regarding the characteristics of students with high self-determination including



students who will have perseverance and persistence in achieving goals, enjoy academic tasks more, have higher self-satisfaction, commit towards their actions, and harmonious relationships with lecturers or friends and show higher conceptual knowledge. During the Covid-19 Pandemic, lectures were conducted online so that various assignments from Lecturers were also given and done online. Students who have high digital literacy will find it easier to use various existing digital media to complete assignments so they will tend to enjoy completing their academic assignments. Furthermore, one of high self-determination is in communication, and this good communication will certainly be shown by students who have high digital literacy because they will pay attention to appropriate procedures for communicating and discussing in the digital world.

## ■ CONCLUSIONS

The results showed that most of the learning resources used by students were already using digital devices or media such as the internet, e-books, and the like, reaching 95.7% of 723 respondents. The results of another analysis show that when viewed from a gender perspective, digital literacy and self-determination have differences between men and women, but they do not apply to curiosity. Furthermore, student digital literacy has a positive influence on curiosity and self-determination.

Based on the conclusions of the research, in lectures, lecturers need to increase activities or assignments for students that can encourage their digital literacy skills, because this can affect Curiosity and student self-determination. In future research, it may be possible to multiply the sample with a balanced proportion between men and women and the results can be compared with this study. Besides that, it can also be examined as a causal relationship by looking at it from a different point of view, by changing digital literacy as the dependent variable.

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