

ANALYSIS OF STUDENT DIGITAL LITERACY IN LINEAR ALGEBRA COURSES DURING THE COVID-19 PANDEMIC

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Abstract

The purpose of this study is to analyze and describe the ability of students' digital literacy in linear algebraic courses using online learning during the Covid-19 pandemic. Respondents to this study came from students of mathematics education program University of Muhammadiyah Tangerang numbered 30. The research method used qualitative descriptive, with instruments in the form of digital literacy questionnaires using a likert scale. The results showed that students' digital literacy has an average score of 75.20 with a high category with an average score of the ability indicator ability to operate a computer 82.00, Ability to build information 70.00, Take advantage of internet access 72.00, Present information 74.00, and Ability to communicate and publish 78.00.

Keywords: Covid-19; digital literacy; linear algebra.

Abstrak

Tujuan penelitian ini untuk menganalisis dan mendeskripsikan kemampuan literasi digital mahasiswa pada matakuliah aljabar linier dengan menggunakan pembelajaran *online* selama pandemi Covid-19. Responden penelitian ini berasal dari mahasiswa program studi pendidikan matematika Universitas Muhammadiyah Tangerang berjumlah 30. Metode penelitian yang digunakan kualitatif deskriptif, dengan instrumen berupa angket literasi digital dengan menggunakan skala likert. Hasil penelitian menunjukkan bahwa literasi digital mahasiswa memiliki rata-rata skor 75,20 dengan kategori tinggi dengan skor rata-rata indikator kemampuan mengoperasikan komputer 82.00, kemampuan membangun informasi 70.00, memanfaatkan akses internet 72.00, menyajikan informasi 74.00, serta kemampuan berkomunikasi dan publikasi 78.00.

Kata kunci: Aljabar linier; covid-19; literasi digital.



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INTRODUCTION

The tsunami of online learning has occurred almost all over the world during the Covid-19 pandemic. Teachers and educators as an important element in teaching are required to make unprecedented massive migrations from face-to-face education

to online education or distance education (Bao, 2020; Basilaia & Kvavadze, 2020); Online learning was developed as a learning medium that can connect online between educators and students in a virtual classroom without having to be physically in one room (Zhu & Liu, 2020).

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Sufanti (2019) the presence of digital technology in learning in the era of industrial revolution 4.0 is an inevitability. Its presence offers how to interact, communicate, and socialize easily and new with the support of interesting features, many tools and applications that can be used by teachers or lecturers in carrying out teaching and learning activities virtually or online, among others can use google meet application, zoom application, google classroom, youtube, television, and social media whatsapp which is considered the most appropriate to apply. Weigand (2010) asserts that digital technology is the thing that most affects the education system in the world today. This is due to the effectiveness, efficiency and attractiveness offered by digital technology-based learning. Benson & Kolsaker (2015) digital technology has become an integral part of the world of education.

Digital literacy is important for people in an increasing digital culture. Digital literacy prepares people to understand and develop socially, intellectually and economically, so as not to ignore the social and cultural practices of digital literacy that encourage a person to engage in multiple interactions with digital technology and media (Çakmak et al., 2013). Paul Gilster (Wakhidah & Sunismi, 2020) the ability to understand and use information in various forms of various sources and accessed through tools with computer technology. Pratama et al., (2019) Digital literacy is one of six basic literacy applied mainly in learning activities. The other five things include literacy, numeration, science, finance and culture and citizenship. Becker (2018) Digital literacy is the ability to use information and communication technology in a

variety of activities, namely finding, understanding, evaluating, creating, and communicating digital information.

Some previous studies that have been conducted related to digital literacy include: Pratama et al., (2019) the application of schoology-based e-learning on impulse and momentum materials can train digital literacy but the practice of digital literacy is still not optimal; Nahdi & Jatisunda (2020) the results showed that as a large number of students have basic skills in internet, they are able to find and retrieve information from the internet, as well as use it effectively; Rahmadani (2020) digital literacy level of students with high mathematical ability towards Learning Media Matur Suwon on social arithmetic material has a moderate level of digital competence. Students with moderate math skills have a moderate level of digital competence. Meanwhile, students with low math skills have a low level of digital competence.

Based on the description above and from previous research, the purpose of this study is to obtain an overview of students' digital literacy in linear algebraic course learning during the Covid-19 pandemic.

METHOD

This study was conducted to analyze and describe students' digital literacy in linear algebraic courses. This type of research is qualitative descriptive research. The approach used in this study emphasizes more on descriptive studies for data analysis. The techniques used to collect digital literacy data are through polls, using a scale of 1-5. Data analysis digital literacy questionnaire conducted by summing the value of each aspect of the ability. Highest value of every aspect dominant ability. The subjects in this

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study were 3rd semester students majoring in mathematics education at University of Muhammadiyah Tangerang with a total of 30 respondents but analyzed in this study as many as 4 respondents because it is considered to represent a variety of respondents. The role of researchers is as the main instrument in this study. Supporting instruments in this study are questionnaires prepared based on digital literacy indicators. The spread of the questionnaire was conducted via google form due to the covid-19 pandemic outbreak and the scale used in this study was the Likert scale. Likert scale is used to measure the attitudes, opinions and perceptions of a person or group of people about social phenomena.

The techniques used to collect digital literacy data are through polls, using a scale of 1-5. The score obtained is then adjusted to criteria in Table 1.

Table 1. Classification of questionnaire score results

Score	Category
75-100	High
50-74.99	Medium
25-49.99	Less
0-24.99	Low

The data analysis technique used in this study is qualitative data that is given by questionnaires with a likert scale containing negative and positive statements totaling 25 statements. The research data that has been obtained is then analyzed and reduced. the presentation of the data is done in narrative form.

RESULTS AND DISCUSSION

In this study, teaching and learning activities were conducted online. Students are given learning materials and videos that correspond to

the materials discussed. Students are given the opportunity to discuss, give opinions, submit arguments related to the material discussed or ask about materials or issues that have not been understood. And students are also given the opportunity to search for materials from various sources both from books and online sources. if there is a student experiencing a mistake in understanding a concept, then other students or lecturers can immediately improve. The next stage is the provision of digital literacy questionnaires to students. This study discusses how digital literacy students are on linear algebraic courses. The questionnaire given aims to know the digital literacy of students, digital literacy indicators are adapted from Lamada et al., (2019) operate the computer, 2) the ability to build information, 3) utilize internet access, 4) present information, 5) the ability to communicate and publish.

Supporting instruments in this study in the form of questionnaires compiled based on digital literacy indicators. The spread of the questionnaire was conducted via google form due to the covid-19 pandemic outbreak and the scale used in this study was the Likert scale. The questionnaire given is a questionnaire with a likert scale containing negative and positive statements totaling 25 statements. Sugiyono (2016) the Likert scale is used to measure the attitudes, opinions and perceptions of a person or group of people about social phenomena. Digital literacy questionnaire scores are obtained based on scoring criteria adapted from Sugiyono (2016).

The results showed that students' digital literacy has an average score of 75.20 with a high category with an average score of the ability indicator ability to operate a computer 82.00,

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Ability to build information 70.00, Take advantage of internet access 72.00, Present information 74.00, and Ability to communicate and publish 78.00.

Table 2. Digital literacy indicators

No	Indicator	Score	Category
1	Ability to operate a computer	82.00	High
2	Ability to build information	70.00	Medium
3	Take advantage of internet access	72.00	Medium
4	Present information	74.00	Medium
5	Ability to communicate and publish	78.00	High
Total		75.20	High

To achieve the desired results maximum in the learning process, a person is not only required to able to use digital devices well, but also must be understand everything related to with digital technology (Akbar & Anggraeni, 2017). Student digital literacy during the linear algebraic course learning process during the Covid-19 pandemic as a whole falls into the high category of 75.20. The highest indicators are the ability to interpret computers and the ability to communicate and publish, this is in line with the opinion of Giovanni & Komariah (2020) that there is a significant relationship between information competency, communication competency, content creation competency, and security competency with student learning achievement; Amalia (2015) that students' ability to build communication, publication, and social relations through the internet has a significant influence on digital literacy. It is seen that many students are active on several social media at once, Whatsapp (63.1%), Line (62.1%), Instagram (60.1%), Twitter (46.1%), Path (24.2%), lastly is the choice of other social media (14%).

The description of digital literacy can be seen from S1, S2, S3, and S4 respondents. Respondents S1 to S4 showed indicators of good operating ability, this is because S1 already understands the basis of operating system (OS), understands features and applications in Ms. Office (Ms. Word, Excel, and power points) ranging from files, home, inserts, page layouts, and picture tools. But on the other hand, S1 does not show indicators utilizing poor internet access. This is because S1 is more active in surfing entertainment media and social media ranging from facebook, Whatsapp, instagram, and twitter than looking for learning resources and references for assignments given by lecturers. A'yuni (Akbar & Anggraeni, 2017) states that the high intensity of a person to seek something with the help of the internet is not ensure high digital literacy. Because, digital literacy is not only assessed from the use of digital devices only, but with other competencies such as the ability to evaluate content obtained from the internet; Lei & Zhao (Higgins et al., 2012) that the use of digital technology has not been a factor in key in the learning process. They also emphasize that the most important thing in digital literacy is to know purpose and how the device is used digital, not how often in using a digital device.

In contrast to S1 respondents, S2 respondents use the internet as a learning resource when there are orders or demands from lecturers to look for lecture materials such as journals or search for literature materials from assignments given by lecturers to make papers and so on. However, material taken or accessed from the internet is only stored and not read. This is very contradictory with S3 and S4 respondents, they are more independent

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and wise to access the internet to search for various information and science according to the needs relevant to the subject of the course, such as accessing freelance articles, e-books (electronic books), e-journals (electronic journals). This is reinforced by Nahdi & Jatisunda (2020) stated that the majority of students (69.1%) realize that they rarely use print media (books, newspapers, magazines, etc) in seeking information. To help with learning activities, they rely heavily on electronic media (45.6%). Some are those who regularly use online video (41.2%), and digital libraries (5.9%).

The findings of this study are showed that students' digital literacy has an average score of 75.20 (high category) with an average score of the ability to operate a computer 82.00, ability to build information 70.00, take advantage of internet access 72.00, present information 74.00, and ability to communicate and publish 78.00. We can see the use of online learning by using applications and some features can optimize the digital literacy.

Based on the findings that have been obtained in this study, so for the next research must be examine digital literacy in more detail and in depth. As revealed Cheema (2013) that a better understanding of digital literacy of mathematics is thus the first step towards a better understanding of mechanical mathematical achievement in other words digital literacy has a tight relationship with academic achievement; Sonck et al., (2011) digital skills in children with measurement of various online activities are well received and practical; Sai (2017) This digital literacy ability is indispensable for students, because with this ability they can adapt the positive values of the digital age as it is today.

CONCLUSION AND SUGGESTION

Based on the results of research and discussion concluded that the average digital literacy score of students is relatively high. Learning results and achievements are not only supported by the methods and media used but good digital literacy is required. This is in line with the results of research showing that the average score of digital literacy indicators 75.20 with a high category.

The results of this study show that improving digital literacy and students' skills in using information technology is important to do, especially in implementing online learning based on virtual classrooms. This is so that students achieve better results in the learning process even in the midst of the Covid-19 pandemic. Based on the results of the survey obtained findings that overall students have basic skills in using the internet, they are able to find and retrieve information from the internet, as well as use it effectively. Hague & Payton (2011) literacy good digital services also play a role in developing knowledge someone about the subject matter by encouraging a sense of wanting to know and creativity they have.

The advice of the results of this study is so that educators can develop the school literacy movement in the form of digital literacy, which will also support generations that are not only literate but also the digital generation.

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