IJEBA: *International Journal of Economics, Business and Applications*
p-ISSN: 2477-1244, e-ISSN: 2477-1236
Accepted:September 25 th 2021

Factors Influencing The Digital Literacy Competency Of College Students In The Industrial Revolution Era 4.0

[1]Dhian Rosalina, [2]Kartika Yuliari, [3]Dias Setianingsih, [4]Muhammad Rizqi Zati

[1]Faculty of Economics Samudra University
[2]Faculty of Economics Kadiri University
[3]Faculty of Economics Samudra University
[4]Faculty of Economics Samudra University

Email: *dhian.rosalina@unsam.ac.id*

Abstract: *This study aims to analyze the factors that influence digital literacy competence in students in the era of industrial revolution 4.0. This research found that the sampling technique used was purposive sampling at the Faculty of Economics, the University of Kadiri. The number of respondents was one hundred students—the analysis used Confirmatory Factor Analysis. The results of the study show that three factors that influence the level of digital literacy competence of students, including (1) Environmental support factors consist of the campus environment and family roles; (2) Socio-economic conditions factors include individual financial conditions and the criticality of the media; (3) The intensity factor of media use includes the use of digital media in daily activities and the completion of academic tasks.*

Keywords: Digital Literacy; Industrial Revolution 4.0

INTRODUCTION

Indonesia is in the industrial revolution era, where information technology has influenced various aspects of life, both in social relations, business relations, education, and other aspects. Information technology has various impacts that are felt directly by humans. For example, various digital applications on the internet have simplified and made work more practical in daily life. Digital transformation can improve cost efficiency and productivity, improve the quality of education in terms of a good system, improvement of human resources, scientific development, and physical development (Aini & Istiana, 2016). Universities are part of an education system that is highly adaptive in the development of digital transformation. The impact of the industrial

revolution 4.0 era itself can be felt in the teaching and learning process, including information disclosure where information can be obtained in real-time, anytime, and anywhere can be accessed freely. As is well known, information is very easy to obtain with search engines to assist users in finding the desired reference and without spending much money as well as teaching materials, online journals, and interactive activities that have been presented in digital form as a form of technological progress (Setyaningsih, Abdullah, Prihantoro, & Hustinawaty, 2019).

Most Indonesians are active users of information technology, with many users in the world. In a document released by the Indonesian Internet Service Providers Association (APJII, 2020), which can be seen in Figure one below, in the range of 2019 to 2020, internet users in Indonesia reached 73.7% of the population or 196.71 million people from the total population is 266.91 million people. This number has increased by 8.9% when compared to the survey conducted in 2019. From these results, 13.8% of internet users are students up to the student's level, which is equivalent to 27.145 million students. With the high use of the internet among students, the adaptation of information technology-based learning must become a culture of teaching and learning at various levels of education, especially universities that function to print the nation's superior and professional resources.

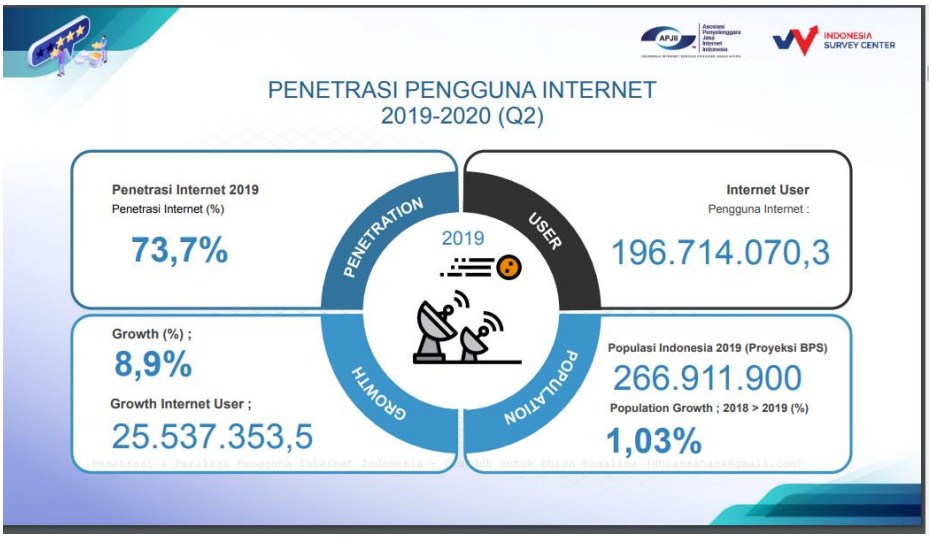

Figure 1. Data on Internet Users in Indonesia Based on APJII Survey

The concept of digital literacy is the ability of individuals to use various digital platforms in using, evaluating, and writing information (Meyers, Erickson, & Small, 2013). Digital literacy is an individual's shrewdness in managing various information received with the technology used at that time. The need for information affects the intensity of the use of digital media as literacy (Syah, Darmawan, & Purnawan, 2019).

Digital literacy competence is very much needed, along with disclosing information that needs to be traced to the truth and its accuracy to be processed as needed. To master these competencies, users' experience in using digital media is an absolute must.

Students attending lectures cannot be separated from the help of gadgets. The practice of copy and pastes among students is often found when completing assignments, which comes from search results through search engines such as Google, which are commonly used instead of looking for books in the library. Based on observations, students rarely use references from scientific journals even though their existence is very easy to access. Sometimes, they even rely on copy and pasting from blogs where the validity of the information is doubtful. This is in line with research conducted by (Kurniawati & Baroroh, 2016) that although digital information sources are very abundant that are open access, such as e-journals, full-text databases, e-books, e-images, e-audio, and videos, most students do not use appropriate references. in completing their lectures, this shows that digital literacy among students is still not good because some students are not able to choose the much information responsibly correctly.

Based on the discussion above, the purpose of this study is to identify the factors that influence digital literacy competence in students of the Faculty of Economics, Kadiri University - considering that digital literacy competence is needed to maximize the amount of information by using the correct references. So that students can criticize misleading information and use quality information in completing academic assignments. Moreover, at the same time increasing the individual competence of students in the era of the industrial revolution.

METHOD

This research was quantitative descriptive. The descriptive analysis studied phenomena by analyzing the problems, procedures, and situations that apply. Descriptive research also analyzed other things such as relationships, views, activities, attitudes, and processes currently taking place in society (Yuwono et al., 2007). Confirmatory Factor Analysis was an analytical tool in this study. The aim is to find factors that affect the level of digital literacy competence in students. It was easier for researchers to identify the dimensions of the structure by using CFA. The researcher would determine the extent to which these variables are explained by each dimension (Ghazali, 2011).

The respondents of this study were students of the Faculty of Economics, Kadiri University. In taking the sample, the researcher used purposive sampling. The students who were the respondents in this study had the following criteria: a) Active status, b) respondents who have taken at least two semesters. Data collection uses a google form questionnaire, which is distributed to respondents who meet predetermined criteria. This study used a Likert scale of one to five. Of the one hundred people who were collected as respondents, in terms of gender, there were 55 female respondents and 45 male respondents. All of them were students of the Faculty of Economics, University of Kadiri, taking semesters five and seven. With these criteria, respondents have sufficient insight and can objectively provide perceptions under reality.

Digital literacy is a habit in personal and social life by using digital media as needed. Digital literacy involves identifying digital resources and content to reach, manage, and analyze or synthesize, form new data, create new ways of media expression. They are making it possible to communicate with others (Ozdamar-Keskin, Ozata, Banar, & Royle, 2020). According to Mcloughlin (2011), digital literacy is the ability to choose and use digital technology at any time in a directed way. Digital literacy is also related to critical thinking about the opportunities and benefits of frequently used digital technologies such as social networks and smartphone applications.

According to research conducted by Bawden (2001), Eshet-Alkalai & Chajut (2010), Tirado-Morueta, Aguaded-Gómez, & Hernando-Gómez (2018) environmental, and socio-demographic factors were the causes of the digital literacy competency gap in individuals. These factors can be summarized in the following table:

Table 1. Factors Influencing Digital Literacy Competence

Factors	**Previous Study**
Age	Eshet-Alkalai & Chajut, (2010); Tirado-Morueta et al., (2018)
Family role	Syah et al. (2019)
Intensity of Internet Usage	Syah et al., (2019); Tirado-Morueta et al., (2018)
Organizational support	Karim, 2020; Zhafira, Ertika, & Chairiyaton, (2020)
Socio-Economic	Eshet-Alkalai & Chajut, (2010); Tirado-Morueta et al., (2018)

Source: Processed data, 2021 (SPSS Output)

According to Mcloughlin (2011), digital literacy combines various skills closely related to media, information, and visual literacy. This opinion was reinforced by (Ozdamar-Keskin et al., 2020) which stated that there were several elements of digital literacy consisting of:

a. Information Literacy, namely the ability to find, analyze and summarize information, including evaluating the credibility of information sources and awareness of using and citing ethically and legally, focusing on topics, and formulating research questions accurately, effectively, and efficiently.
b. Computer Literacy, namely the ability to use computers and application software for the completion of goals.
c. Media Literacy, the ability to communicate information using digital media
d. Communication Literacy, the ability to communicate and work together both individually and in a team using digital media
e. Visual literacy is the ability to understand the information presented in the form of graphics/images and convert knowledge of all types into graphics or communicative forms.

RESULTS & DISCUSSION

Descriptive statistics

This study uses the mean value to determine the average score of respondents' answers in the google form. The results of this descriptive statistical analysis can be seen in the following table below:

Tabel 2. Mean Value

	Mean	Std. Deviation
1. Have an excellent academic record	3.96	.963
2. Accustomed to using the internet in daily activities	3.50	1.096
3. Accustomed to using digital media in completing academic assignments	**3.24**	1.102
4. Have sufficient financial resources to access information on a regular basis	**4.69**	**.677**
5. Families facilitate gadgets used for college activities	3.97	.926
6. The college facilitates a network connection (wifi) that can be accessed freely by students	3.96	1.072
7. Universities provide access to e-books, reputable online journals for students	3.75	**1.104**
8. Think critically about the information received in digital media	4.23	.839

Source: Processed data, 2021 (SPSS Output)

The highest mean value is in factor number four, which is having sufficient financial resources to access information regularly, with a score of 4.69. With the highest mean value among other factors, respondents perceive that ownership of financial resources has the most perceived impact in influencing students' digital literacy competencies. While the lowest mean value is in factor three. Factor three contains statements about being accustomed to using digital media in completing academic tasks. Respondents perceive this factor as having the least perceived impact in influencing digital literacy competence. Factor number seven, namely universities providing access to e-books, reputable online journals to students, has the highest standard deviation of 1.104. This means that these factors are not felt equally by the respondents. At the same time, the lowest standard deviation is in factor number four, namely the ownership of sufficient financial resources to access information regularly, with a score of 0.677, which means that this factor is felt equally by respondents in its influence on students' digital literacy competencies.

Confirmatory Factor Analysis Test

a. KMO and Bartlett Test

Based on the results of the KMO test (Kaiser-Meyer-Olkin) and the Bartlett"s Test, the MSA (Measure of Sampling Adequacy) score from data processing is 0.76 and a significance of 0.05 so that with a significance of less than 0.05, the proposed variable can be continued with factor analysis (Ghazali, 2011), as well as in the Anti-image Correlation table, there is no single variable that has an MSA below 0.5 so that the testing process can be continued.

b. Commonality

The second stage is the factoring process. This is the extraction process of the variables being observed, thus forming one or more factors. The results of this process can be seen in the commonalities table below:

Table 3. Commonalities

Variable	Extraction
1. Have an excellent academic record	.711
2. Accustomed to using the internet in daily activities	.646
3. Accustomed to using digital media in completing academic assignments	.804
4. Have sufficient financial resources to access information	.651

on a regular basis	
5. Families facilitate gadgets used for college activities	.746
6. The college facilitates a network connection (wifi) that can be accessed freely by students	.834
7. Universities provide access to e-books, reputable online journals for students	.703
8. Think critically about the information received in digital media	.701

Source: Processed data, 2021 (SPSS Output)

The relationship between a variable and the formed factor can be seen from the extraction score (Yuwono et al., 2007). The greater the extraction value on the variable means that the variable has a strong relationship with the formed factor. From the table above, the most considerable extraction value is in Variable six; namely, universities facilitate network connections (wifi) that can be accessed freely by students, with a score of 0.834 which means 83.4% of the variation in the variable universities facilitate network connections (wifi) can be explained by the factors formed. In contrast, the second variable has the lowest extraction score of 0.646, which means that the formed factors explain only 64.6% of the variation in daily internet usage.

c. Eigenvalue

The next step is to look at the number of factor extractions in the following table below:

Tabel 4. Total Variance Explained

Component	Initial Equivalent		
	Total	**% of Variance**	**Cumulative %**
1	**3.225**	40.314	40.314
2	**1.396**	17.455	57.769
3	**1.175**	14.682	72.451
4	.710	8.878	81.329
5	.519	6.483	87.812
6	.428	5.349	93.161
7	.327	4.088	97.248
8	.220	2.752	100.000

Source: Processed data, 2021 (SPSS Output)

From the table above, the factoring process has formed three factors from eight variables. This can be seen from the fourth factor's eigenvalue score, which is below one, which is 0.710, so the factoring process stops at three factors. At the same time, the percent of the variance of the three factors is 72.45%, which means that these three factors can explain the variability of the original eight variables up to 72.45%.

d. Factor loading

Moreover, the last step in factor analysis is factor loading. In this process, eight variables will be grouped into three form factors described in the previous table.

Table 5. Rotated Component Matrix

	Component		
	1	2	3
1. Have a good academic record	.393	.526	**.529**
2. Accustomed to using the internet in daily activities	.226	.427	**.643**
3. Accustomed to using digital media in completing academic assignments	.064	-.123	**.886**
4. Have sufficient financial resources to access information on a regular basis	.156	**.785**	-.100
5. Families facilitate gadgets used for college activities	**.824**	.233	-.117
6. The college facilitates a network connection (wifi) that can be accessed freely by students	**.883**	.065	.221
7. Universities provide access to e-books, reputable online journals for students	**.767**	-.026	.338
8. Think critically about the information received in digital media	-.031	**.822**	.157

Source: Processed data, 2021 (SPSS Output)

From the table above. The distribution of the variables can be seen by using the component matrix. The guideline used is to look at the factor loading numbers to group each variable into three formed factors. The following is an explanation of the rotated component matrix table:

1. Variable one: "Having good academic achievement" has the most considerable factor loading score in factor three (0.529), so it is included in factor three.
2. Variable two: "Used to use the internet in daily activities" has the highest factor loading score in factor three (0.643), so it is included in factor three.
3. Variable three: "Used to use digital media in completing academic assignments" has the highest factor loading score of factor three (0.886), so it is included in factor three.
4. Variable four: "Having sufficient financial resources to access information on a regular basis" has the highest factor loading score in factor two (0.785), so it is included in factor two.

5. Variable five: "Family facilitates gadgets used for college activities" has the most significant factor loading score in factor one (0.824), so it is included in factor one.
6. Variable six: "Universities facilitate network connections (wifi) that can be accessed freely by students" has the highest factor loading score in factor one (0.883), so it is included in factor one.
7. Variable seven: "Universities provide access to e-books, reputable online journals to students" has the highest factor loading score in factor one (0.767), so it is included in factor one.
8. Variable 8: "Thinking critically about the information received in digital media" has the highest factor loading score in factor two (0.822), so it is included in factor two.

From the explanation above, the eight variables have been categorized into three factors. Furthermore, the next step is naming the three factors that represent the variables that make up each factor.

a. Factor one consists of variables: a) Families provide support in facilitating gadgets used for college activities, b) Colleges facilitate network connections (wifi) that can be accessed freely by students, c) Colleges provide access to e-books, online journals reputation for students. These results are consistent with previous research conducted by Karim (2020), Kaunain & Akhtar (2016), Rusdiana & Nugroho (2017), Zhafira et al. (2020). In this case, the campus environment and student families have a role in shaping digital literacy competencies.

   The role of the family, in this case, is to provide encouragement and gadget facilities that make it easier for students to access information for completing academic assignments. The role of parents is crucial because in developing children's education through someone's informal education. At the same time, college support is a facility provided to students to support task completion. In academics, the facilities provided can support digital literacy competencies such as free wifi, access to reputable journals, blended learning that combines online and offline lectures. From this explanation, factor one is called the **environmental support factor.**
b. The second factor consists of variables: a) Having sufficient financial resources to access information regularly, b) Thinking critically about the information received in digital media. These results are consistent with several previous studies (Eshet-Alkalai & Chajut, 2010; Tirado-Morueta et al., 2018) that differences in socio-

economic conditions have a relative effect on digital literacy competence. Demographic conditions in terms of socio-economics affect digital literacy competence relatively (Tirado-Morueta et al., 2018). Based on previous research, gaps in conditions such as income level, status, type of work affect the use of information from digital media intelligently. In accessing information, students need money, whether for the purchase of gadgets, data quotas, or other technological devices that support the completion of academic assignments. Based on this explanation, factor two is called the factor of socio-economic conditions.

c. Factor three consists of variables a) Have good academic achievement, b) Accustomed to using the internet in daily activities, c) Accustomed to using digital media in completing academic tasks. These results are from Syah et al. (2019); Tirado-Morueta et al. (2018). The more intensely individuals contact information technology in all aspects of life, the greater the experience in evaluating and selecting the correct information. So that it affects the individual's digital literacy competence, from this explanation, the following third factor is named the intensity factor of using digital media.

CONCLUSION

The industrial revolution 4.0 has affected many aspects of human life, including the abundance of information and how to use information technology in the education sector. Based on the research results regarding the digital literacy competence of students at the Faculty of Economics, Kadiri University. The result is that competence is influenced by three factors: environmental support factors, socio-economic conditions, and the intensity of using digital media. Based on these results, universities increase student competence in environmental support factors and the intensity of using digital media.

Universities play a role in providing information technology-based learning facilities and implementing blended learning. This is to maximize the intensity of the application of information technology in the learning process, which is known to have been used by the COVID-19 pandemic. In addition, universities must develop curricula that can adapt to advances in information technology.

REFERENCES

Aini, R. N., & Istiana, P. (2016). Kompetensi pustakawan perguruan tinggi dalam era revolusi industri 4.0. *Jurnal Pustakawan Indonesia*, *17*(2), 71-78.

APJII. (2020). Laporan survei internet APJII 2019-2020. *Asosiasi Penyelenggara Jasa Internet Indonesia*, *2020*, 1-146. Retrieved from https://apjii.or.id/survei.

Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of Documentation*, *57*(2), 218-259. https://doi.org/10.1108/EUM0000000007083.

Eshet-Alkalai, Y., & Chajut, E. (2010). You can teach old dogs new tricks: The factors that affect changes over time in digital literacy. *Journal of Information Technology Education: Research*, *9*, 173-181. https://doi.org/10.28945/1186.

Ghazali, I. (2011). *Aplikasi analisis multivariate dengan program IBM SPSS 19* (5th ed.). Semarang: Universitas Diponegoro.

Karim, B. A. (2020). Pendidikan perguruan tinggi era 4.0 dalam pandemi covid-19 (refleksi sosiologis). *Education and Learning Journal*, *1*(2), 102. https://doi.org/10.33096/eljour.v1i2.54.

Kaunain, F., & Akhtar, S. N. (2016). Economic determinant of family takaful: Evidence from Pakistan. *Acta Islamica*, *2*(4), 7-41. https://doi.org/10.12816/0037640.

Kurniawati, J., & Baroroh, S. (2016). Literasi media digital mahasiswa Universitas Muhammadiyah Bengkulu. *Jurnal Komunikator*, *8*(2), 51-66. Retrieved from http://journal.umy.ac.id/index.php/jkm/article/view/2069.

Mcloughlin, C. (2011). What ICT-related skills and capabilities should be considered central to the definition of digital literacy ? *Europe*, 471–475.

Meyers, E. M., Erickson, I., & Small, R. V. (2013). Digital literacy and informal learning environments: An introduction. *Learning, Media and Technology*, *38*(4), 355-367. https://doi.org/10.1080/17439884.2013.783597.

Ozdamar-Keskin, N., Ozata, F. Z., Banar, K., & Royle, K. (2020). Examining digital literacy competences and learning habits of open and distance learners. *Contemporary Educational Technology*, *6*(1), 74-90. https://doi.org/10.30935/cedtech/6140.

Rusdiana, E., & Nugroho, A. (2017). Respon pada pembelajaran daring bagi mahasiswa mata kuliah Pengantar Hukum Indonesia. *Integralistik*, *19*(2), 148-152. Retrieved from

https://journal.unnes.ac.id/nju/index.php/integralistik/article/view/21834/.

Setyaningsih, R., Abdullah, A., Prihantoro, E., & Hustinawaty, H. (2019). Model penguatan literasi digital melalui pemanfaatan e-learning. *Jurnal ASPIKOM*, *3*(6), 1200. https://doi.org/10.24329/aspikom.v3i6.333.

Syah, R., Darmawan, D., & Purnawan, A. (2019). Analisis faktor yang mempengaruhi kemampuan literasi digital. *Jurnal Akrab*, *10*(2), 60-69.

Tirado-Morueta, R., Aguaded-Gómez, J. I., & Hernando-Gómez, Á. (2018). The socio-demographic divide in Internet usage moderated by digital literacy support. *Technology in Society*, *55*(March 2017), 47–55. https://doi.org/10.1016/j.techsoc.2018.06.001.

Yuwono, R., Retno, R. R., Bisnis, P. M., Manajemen, P. S., Petra, U. K., & Siwalankerto, J. (2007). *Analisa faktor-faktor penghambat pertumbuhan di Jawa Timur*. *1*(3).

Zhafira, N. H., Ertika, Y., & Chairiyaton. (2020). Persepsi mahasiswa perhadap perkuliahan daring sebagai sarana pembelajaran selama masa karantina Covid-19. *Jurnal Bisnis Dan Kajian Strategi Manajemen*, *4*, 37-45.