

Measuring Digital Literacy in Sidoarjo Regency

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ABSTRACT

Digital communication has replaced reading and writing as the primary forms of communication due to the Internet and social media use. In addition, it is critical to comprehend and use digital literacy in a field because of the expanding potential of information and communication technologies. This study aims to evaluate and clarify the level of digital media literacy among residents of the Sidoarjo Regency, describing how digital literacy differs at each level of education and calculating the Sidoarjo Regency's digital literacy index. A sample of 278 respondents for this quantitative descriptive study was selected using the cluster random selection technique. The questionnaires for this survey were distributed using the social media platform, WhatsApp. It consists of eight components of digital literacy, namely the ability to find, select and analyze information; effective communication skills; collaboration capabilities; digital presence capabilities; critical and evaluative thinking skills; creativity ability; the ability to effective practical skills; and cultural, social, and ethical abilities. The results of the study show that digital literacy abilities in Sidoarjo Regency based on education vary. Digital literacy skills with junior high school education have an index of 76.35. Those with high school education have a digital literacy index of 79.19. Then those with a Bachelor's degree education have a digital literacy index of 81.17. In general, the digital literacy index for Sidoarjo Regency is 80.83. In digital literacy, the people of Sidoarjo Regency can think critically and evaluatively. The index on this ability is 84.66.

Keywords: Digital literacy; information-seeking behaviour; digital communication

1. INTRODUCTION

As mandated in Law No. 17 of 2007 concerning the 2005-2025 National Long-Term Development Plan (RPJPN), Indonesia's information society is projected to materialize in the third medium-term period, which is 2015-2019 (Zein & Aimon, 2020). The information society is a society whose main activity is to work to create, process, and convey information and create a communication information technology (Habibah & Irwansyah, 2021; Majid & Usman, 2020)

such as mailing lists, chatting, Friendster, e-learning, use of ATMs, and virtual communities. Through information, a nation can increase economic growth and the country's competitiveness (Safitri & Huda, 2022). In addition, the community is also expected to have the ability to collect, process, and utilize the information that can shape itself into an information society that is useful in improving the standard of living (Mawarni et al., 2022; Chiu et al., 2022). One of the requirements for realizing an information society is easy to access to adequate communication technology, such as infrastructure capacity, quality, broad internet coverage, inclusive digital capabilities, and the amount of infrastructure access. (Ministry of Communication and Informatics Strategic Plan 2020-2024: 2-4).

As quoted from mediaindonesia.com, the Ministry of Communication and Information stated that 2021 smartphone users would reach 167 million people, or 89% of Indonesia's total population (Hanum, 2021). This figure has increased rapidly when compared to 2018. In its press release, the Ministry explained that 66.3% of Indonesians have smartphones spread in urban and rural areas. However, there is still a gap in smartphone ownership between rural and urban areas. It compares that smartphone ownership in urban areas reaches 83.04%, while in rural areas, it is 50.39%. The Instant Messaging application that is widely used on smartphones is Whatsapp. Most Whatsapp users are in the age group of 20-29 years, which is 65.10%. The culture of consumption of credit for smartphones is mostly civil servants, private employees, and non-PNS/honorary. On average, they spend more than IDR 100,000 per month. (www.kominfo.go.id).

Releasing data from *We Are Social* shows that the highest messaging application in Indonesia is WhatsApp, namely 84.8 million users (Annur, 2023), and the rest are Facebook, Instagram, Messenger, Youtube, Clash of Clans, Clean Master, Garena Free Fire, Subway Surfers, and Clash Royale. For social media, the most popular users are also WhatsApp (88%), Instagram (84.4%), Facebook (81.3%), Tiktok (63.1%), Telegram (62.8%), Twitter (58.3%), Messenger (48.6%), Line (39.7%), Pinterest (36.7%), LinkedIn (29.4%), and Skype (14.9%). (Annur, 2023; (Naurah, 2023).

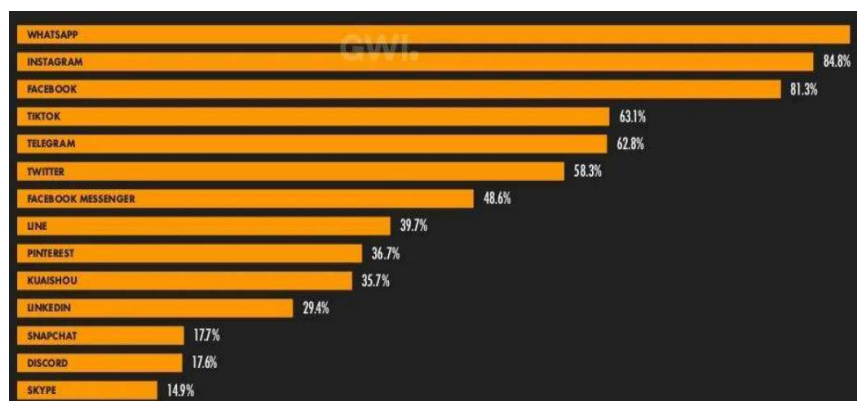


Figure 1. The most often used social media in Indonesia, 2022

Meanwhile, internet users from 2018 to 2022 show an increasing trend. In 2022, there will be 210.03 million internet users in Indonesia. This figure has increased when compared to the results of a survey by the Association of Indonesian Internet Service Providers (APJII) in 2018. In addition, it is known that most Internet penetration in Indonesia is in the Java region (43.92%). While other regions such as Sumatra, amounted to 16.63%; Sulawesi (5.53%);

Kalimantan (4.88%); Bali and Nusa Tenggara (3.88%); and Papua (1.17%). Internet penetration in Indonesia, which reached 77.02% in 2022, is projected to continue to increase until 2023 (Annur, 2023).

The use of the internet and social media has shown that the development of information and communication technology does not only cover access, affordability, and the ability to adopt innovations but also has an impact on life changes, both positive and negative. The exciting thing about the changes is the change in communication culture, which McLuhan mentioned as a new communication culture (Puspitaningrum, 2022). This new communication culture has transformed the culture of reading and writing into digital communication (Munasarah, 2021). Digital communication culture transforms through a digital process, namely the change of media to digital. Second, interactivity, namely changes in digital media that can respond interactively to fellow users. Third, namely dispersal (Habibah & Irwansyah, 2021). Dispersal is a digital media production and message distribution process involving individual activity.

Various studies state that the new era of digital communication has made information the main force in life (Zis et al., 2021; Bahri, 2021; Gasa & Mona, 2020; Rafiq, 2020; Pratama et al., 2023; Santoso et al., 2020) and a source of empowerment power that is based on knowledge (Samsugi et al., 2020; Aprianti et al., 2022). Developing a knowledge society as part of ICT development must be carried out sustainably by strengthening digital media literacy. The aim is to increase public awareness, ability, and capacity to select and utilize media according to their needs. Finally, it can drive economic growth, increase the nation's competitiveness, and increase public participation in making public policies.

Digital media literacy is the ability to use information and communication technology (ICT) to find, evaluate, utilize, create, and communicate content/information with cognitive and technical skills (Ratumanan et al., 2022). Digital media literacy is a pillar of the information society in creating a community with intelligent, critical-creative, positive mindsets and insights. Provocative issues do not easily influence the information society and do not become victims of hoax information or digital-based fraud. For this reason, the socio-cultural conditions of the community need to be directed at intelligence in understanding the flow of digital information and social media civility. Intelligence in using digital media platforms, accuracy in spreading ideas, and foresight in accessing information are important skills in social media transformation.

Starting from this exposure, digital literacy in Sidoarjo Regency in 2022 needs to investigate. The primary arguments used to conduct this research are the fact that first, internet penetration in Indonesia still has a digital divide; second, the utilization of information technology-based information is not yet optimal for the people's economy, which has real economic value; third, the increasing misuse & abuse of information technology and digital media such as hoax information, cyberbullying, violent and pornographic content, black campaigns, hacking, and hate speech. Fourth is the slow development of digital media literacy in Indonesia. Hence, this research aims to analyze and explain the digital media literacy of the people in the Sidoarjo Regency, explain the differences in digital literacy at each level of education, and measure the digital literacy index in Sidoarjo Regency.

2. METHODS

This study uses a descriptive quantitative approach, describing a problem through statistical numbers into information (Tarigan, 2022; Yusuf et al., 2022; Martias, 2021). The data were gathered through a survey by distributing questionnaires using Google form via Whatsapp media. The questionnaire was compiled using variables related to digital literacy, including the ability to find, select and analyze information; effective communication; collaboration; digital presence; critical and evaluative thinking; creativity; effective practical skills and social and ethical culture. The answers to the questions in the questionnaire were prepared using a Likert scale with a score of 1-5.

The research sample was 278 respondents with various levels of education ranging from junior high school to bachelor's degree. Determination of the sample was carried out using the cluster random sampling method, namely the technique of taking samples from the population by randomizing the groups (Riaz et al., 2022). Furthermore, the researcher divided the criteria for assessing digital literacy based on the index conversion value, which was poured into five categories, namely the Very Low, with a conversion value of 0-20; Low, with a score of 21-40; Adequate/Moderate, with a mean score of 41-60; High/Good category, with a mean score of 61 - 80; and Very High, with a mean score of 81-100. The following is the categories scales.

Table 1. Categories value intervals

Value Intervals	Index Value Conversion	Category
0	0 – 20	Very low
1	21–40	Low
2	41–60	Adequate/Moderate
3	61–80	High/ Good
4	81–100	Very good

Measurement of digital literacy is carried out using eight elements. Measurement and analysis of data are carried out using SPSS 25. The calculation is carried out with the following formula:

$$ILD I = \frac{\text{score calculated } i}{\text{Ideal score } I} \times 100$$

The results of testing the validity of the data in this study showed that out of a total of sixty component sub-elements. One item on the cultural dimension (-0.279) was declared invalid. At the same time, the other 59 sub-elements were declared valid with a value above the critical R (0.30), which is 0.4. The results of the research instrument reliability test showed a value of 0.970. This score means that the research instrument can be used repeatedly.

3. RESULTS AND DISCUSSION

The characteristics of the respondents in this study included the characteristics of the respondent's gender, the respondent's age, and the respondent's education. From this study, it is known that the number of male gender is more than female respondents. The average age of the respondents was 15-19 years old (42.86%), and the rest were spread over the ages of

20-24 years (31.68%), 25-29 years old (12.42%), 30-34 years (8.07%), 35-39 years (1.24%), 40-44 years (2.48%), 45-54 years (1.24%). Meanwhile, in terms of education, the respondents in this study were mostly at the educational level of a Bachelor's degree(81.7%) compared to respondents with a junior high school level of education (76.19%) and high school as much as 79.19%. These data can be observed in Table 2:

Table 2. Characteristics of respondents' Digital Literacy Index based on gender, age, and education

Characteristics	Information	Percentage
Gender	Male	51,6
	Female	48,4
Age	15-19 years	42.86
	20-24 years	31.68
	25-29 years	12,42
	30-34 years	8.07
	35-39 years	1.24
	40-44 years	2.48
	45-54 years	1.24
Characteristics	Information	Percentage
Education	Junior high school	76.35
	Senior High School	79,19
	Bachelor Degree	81,17

Source: Primary Data Processed, 2022

In addition to the characteristics of the respondents based on age, gender, and education, the respondents in this study can also analyze the level of utilization of digital technology. This can be seen from the type of computer currently owned; antivirus program used; the operating system used is in the form of HP; use of smartphones, internet with data packages from operators and WIFI; Use of application media on smartphones; Type of social media used; Browsers that are often used and the type of computer used.

Table 2. Use of information and communication technology in Sidoarjo Regency

Use	Information	Percentage
Owned computer	Mobile phone	4
	Personal Computers/ PCs	13
	Laptops/Notebooks	83
Antivirus programs	AVAST	6,3
	AVG	7
	McAfee	3,9
	Microsoft Security	19.5
	Smadav	52,3
	Other	1,6
Operating system on mobile	Don't use antivirus	9,4
	iOs/ iPhone	8
	Windows Phone	1
Internet data packages	Androids	91
	Operator	55
Type of social media used	WiFi	45
	YouTube	17,2

Twitter	54,7
Path	0,8
Instagram	1,6
Facebook	25,8

Source: Primary Data Processed, 2022

Based on Table 3, the understanding of the people of Sidoarjo Regency regarding the use of information and communication technology is that of 278 respondents, 83% use a Laptop/Notebook. This amount exceeds mobile phones by 4% and PC by 13%. The results of this percentage indicate that the people of Sidoarjo prefer to use laptops/notebooks than others. The most widely used antivirus program is Smadav, with 52.3%. Followed by 19.5% who use Microsoft security; AVG by 7%; Avast at 6.3%; McAfee at 3.9%; and others at 1.6%. There are also 9.4% of respondents who do not use antivirus. Three operating systems are used on mobile phones: iOS (iPhone), Windows Phone, and Android. Of the three types of systems, people tend to choose the Android operating system, which is 91%. This number is greater than respondents who use iOS (iPhone) 8% and Windows Phone 1%. This means that most of the people of Sidoarjo Regency use Android phones rather than iOS phones or Windows phones. In addition to using internet data, it is known that the people of Sidoarjo prefer to use internet services through operators compared to WIFI.

Furthermore, after processing, there are types of social media often used by the people of Sidoarjo, such as Youtube, Twitter, Path, Instagram, and Facebook. Of the five social media, the people of Sidoarjo Regency prefer social media via Twitter, 54.7%. They were followed by Facebook at 25.8%, YouTube at 17.2%, and the rest via social media through Path and Instagram.

The foregoing information can be inferred from the idea that mobile phones and the internet are vital to the Sidoarjo people's daily lives. Therefore, a good security system should be installed before using it. So that data loss can be minimized or social media misuse can be prevented. In connection with this, everyone in the community is expected to take precautions like utilizing passwords, turning on the lock screen feature, backing up data, etc.

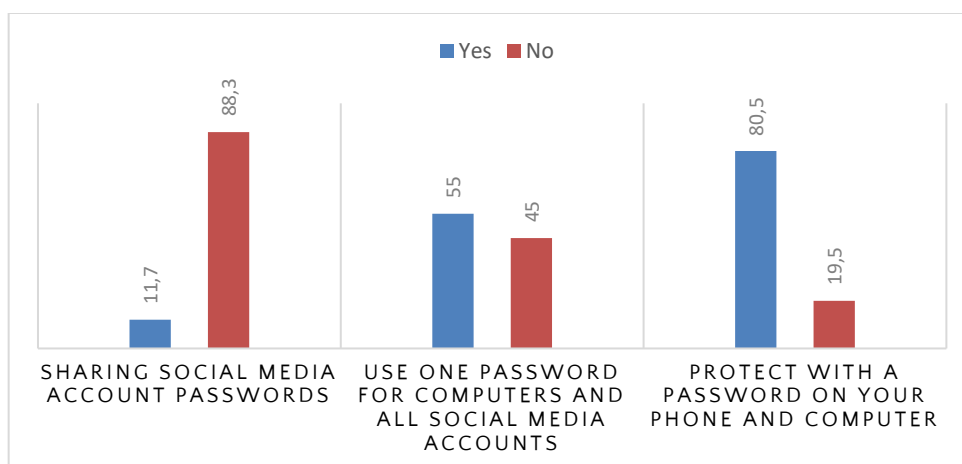


Figure 2. Actions to protect smartphones and computers in the Sidoarjo Regency

Figure 2 illustrates that 88.3% of the people of Sidoarjo Regency do not share social media account passwords with others. Meanwhile, 55% of the people of Sidoarjo Regency use

one password for all their social media accounts. This means that the people of Sidoarjo Regency never share passwords with anyone, considering that the passwords they use on all their social media accounts have the same password. It is proven that 80% of the people of Sidoarjo Regency have protected their smartphones or computers with a password feature.

Digital Literacy Index Analysis

The eight components used to analyze the digital literacy index in Sidoarjo Regency include the ability to find, select and analyze information; effective communication; collaboration; digital presence; critical and evaluative thinking; creativity; effective practical skills and social, and ethical culture. The following will explain the analysis of the eight elements.

1. The ability to find, select, and analyze information

Information can affect the audience on social and individual levels. Therefore, the community must have the ability to choose the media needed, control media use, and interpret media content. The seven sub-elements of the questions submitted to respondents from the people of Sidoarjo Regency are very good. Such as the ability to find the proper technology application has an index of 83.76 (very good). The ability to choose the correct information according to what is needed from online media is 85.04, (very good). Ability to find reliable information in online media 83.39 (very good). Ability to obtain valid information in online media 78.83 (good). The ability to choose and sort between reliable information and hoax information in online media 81.02 (very good). Getting the correct information to increase one's knowledge and skills is 84.49 (very good), and the ability to control messages/information/news online media/social media is 85.49 (very good). This indicates that outlining the first element, namely the capacity to find, select, and analyze information, is outstanding.

2. Effective communication

In the modern era, humans make communication possible through technologies like Google Meet, SKYPE, Zoom, and others. This application helps people build remote communication. However, there are drawbacks to using these programs if literacy skills are not matched with them, such as discrepancies in how one's intentions and aims are interpreted. Effective communication is one strategy to prevent the incidence of disparate message interpretation. When both parties understand the message being given, communication is effective. So, it is possible to avoid misinterpretation or misunderstanding.

Assessment of effective communication can be seen based on how a person uses online communication tools, conveys his intentions and goals to others, and so on. Of the ten questions asked, they tend to be very good. Like the ability to use Video Calls to communicate directly online and effectively or to discuss with colleagues and many friends with a score of 90.97(very good); The ability to write and convey information/messages that are easy for others to understand by using ICT applications such as Whatsapp, Line, Instagram, Facebook at 90.69 (very good); The ability to write and convey information/messages politely to others using ICT applications is 90.60 (very good); The ability to write and communicate information/messages honestly to others using ICT applications is 88.59 (very good); The ability to write and convey information/messages that others can trust using ICT applications is 87.96 (very good). Apart from that, it can also be seen that of the several applications and methods used, the people of Sidoarjo prefer to communicate via video calls rather than through SKYPE or Zoom.

3. Collaboration

The importance of collaboration skills in literacy is so that a person can find out new information from other people, motivate each other, and share new valuable skills for their lives. Sidoarjo community collaboration skills tend to be good and very good. The capabilities of the Sidoarjo community include the ability to discuss and share information using Zoom/Meet/Video Calls 80.20 (very good); Learning by using Zoom/Meet/Video Call/Google Classroom 78.65 (very good); Discuss with friends/colleagues/other participants in seminar forums in online media/Webinars at 65.33 (very good); Sharing knowledge via Twitter, WhatsApp, Pinterest, Line, Facebook, Instagram with friends or work colleagues at 80.38 (very good).

4. Digital presence

Everyone welcomes digital presence. This is so businesses can operate better, education can grow, and innovation may be presented reasonably. In other words, having a digital presence alters how people live. As a result, one must be capable of using tools to balance their digital presence.

The ability of the people of Sidoarjo Regency to have a digital presence. Among them, the ability to apply Google Scholar to find scientific information or research results with an index of 66.15; The ability to use Semantic Scholars to find scientific information or research results (68.89); the ability to use Google Translate for language transliteration purposes (87.86); Ability to use Google Classroom for distance learning (72.90); Ability to use Google Meet for meetings with friends or work colleagues (76.37); Ability to use Zoom for meetings with friends or work colleagues (73.72); Ability to manage YouTube, Instagram, Facebook media to upload videos, photos, images or information (87.41); Ability to use Mendeley to create online libraries (56.48); Ability to use the Online Journal System (OJS) owned by publishers for publication of scientific papers (55.84); Ability to use e-Banking applications for online transactions (73.63); Ability to use e-Commerce applications for online transactions and shopping (70.62).

5. Critical and evaluative thinking

One must be able to think critically and evaluatively in the digital era. This is so that someone can avoid fake news, fraud, and others. The public can sort out information by knowing the validity of the data, the origin of news sources, and so on.

Related to this, the results show that the people of Sidoarjo have a critical and evaluative mindset. The average value of each sub-element is eight. This figure illustrates that the abilities possessed by the people of Sidoarjo are very good. The highest ability possessed is the use of digital media to help the community to obtain and integrate various information needed (87.32) by the people of Sidoarjo. This means that the people of Sidoarjo can filter the available information and what is needed.

6. Creativity

Creativity can make someone survive, like during the Covid-19 pandemic. Many activities have been disrupted, but life must go on. In order not to make matters worse, one must survive

amidst deprivation. One thing that is needed is creativity. Responsiveness possessed by a person can help him read the situation well, explore knowledge and transform information to improve the quality of life.

Seven sub-elements can assess the level of creativity possessed by the community. Creativity of the Sidoarjo people is in very good category. If described with numbers, the Sidoarjo community has a score of 82.76 which states that the use of digital media can generate and present new information and content; The use of digital media helps to select and utilize the creative potential of information and communication technology with an index of 84.22; The use of digital media helps to develop self-potential with an index of 84.49; The use of digital media helps increase self-confidence and motivation to explore and create new things with an index of 84.03; The use of digital media helps to present information in new ways (online presentations, online teaching) with an index of 80.02; The use of digital media helps to create videos/user guides/podcasts with an index of 80.20; The use of digital media can help interact online by including videos, power point displays, assignment attachments with an index of 83.67. Digital media helps create videos/user guides/podcasts with an index of 80.20; digital media can help interact online by including videos, power point displays, and assignment attachments with an index of 83.67. Digital media helps create videos/user guides/podcasts with an index of 80.20; digital media can help interact online by including videos, power point displays, and assignment attachments with an index of 83.67.

7. Effective practical skills

Having effective practical skills a person can be assessed by (1) The use of digital media can help develop and improve technical ICT skills, (2) The use of digital media helps to increase competency and self-confidence, (3) The use of digital media can help improve performance effectively and efficient, (4) The use of digital media can help improve effective and efficient learning, and (5) The use of digital media helps to develop a deeper understanding of software tools and functions to encourage efficient work. The Sidoarjo community owns the five characteristics for assessing a person, and all are at number 8.

8. Cultural, social, and ethical

Cultural, social, and ethical traits are necessary for digital media literacy. This attitude is required to prevent hurting or offending one another, which could split the relationship. In other words, while using digital devices, users must abide by the rules and remain in the passageway. The study's findings indicate that, among the ten factors, the importance of polite online and social media communication is the most significant factor. This proves that the people of Sidoarjo Regency can communicate with others through social media/online in a manner way.

After knowing the value of each element, we can also know the average index of the eight components of digital literacy. Among them are the ability to find, select and analyze information; effective communication skills; collaboration capabilities; digital presence capabilities; critical and evaluative thinking skills; creativity ability; the ability to effective practical skills; and cultural, social, and ethical abilities. This can be described as follows:

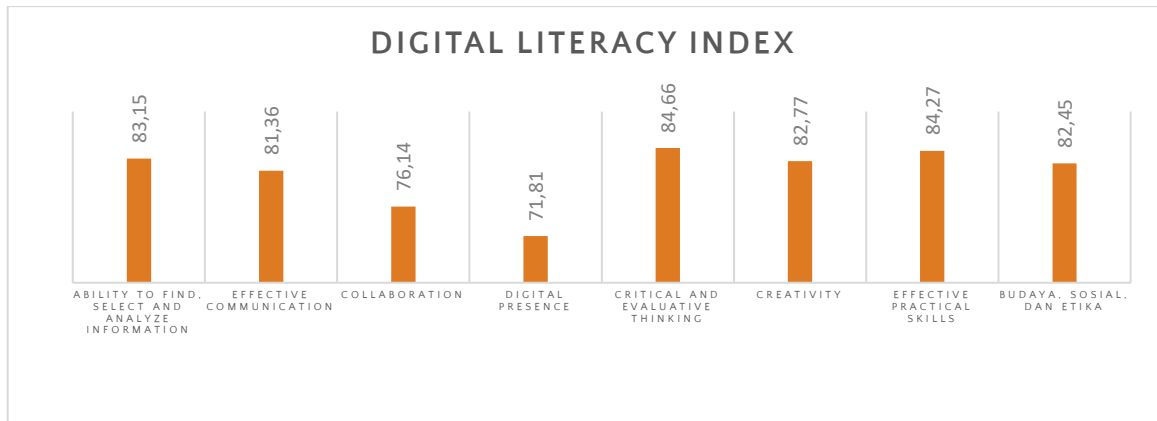


Figure 3. Digital Literacy Index for the community of Sidoarjo Regency

The average digital literacy index in Sidoarjo Regency is 80.83. These results are included in the very good category. The highest score is obtained by the ability to think critically and evaluatively, with a digital literacy index score of 84.66, or the very good category. The second highest component is effective practical skills, with a digital literacy index score of 84.27, which is in the very good category. The element with the lowest score is digital presence, with a score of 71.81 (Figure 3). The digital literacy index can also be identified per level of education in the Sidoarjo Regency community, as seen in the following figure.

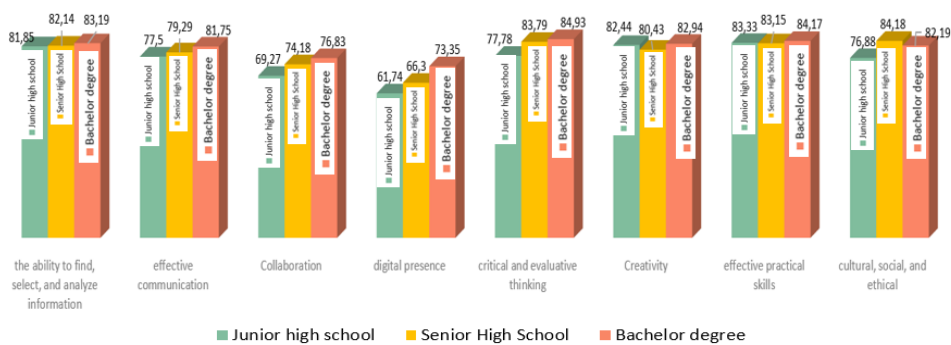


Figure 4. The Eight Components of the Sidoarjo Community's Digital Literacy Index by education level

Figure 4 demonstrates that respondents with a bachelor's degree education level had the highest level of digital literacy among the three categories of respondents' education in terms of the Sidoarjo community's capacity to discover, choose, and analyze information, scoring 83.19. At the same time, it was 82.14 for senior high school students and 81.85 for junior high school students. Besides, Respondents with an undergraduate degree of 81.75, a senior high school level of 79.29, and a junior high school level of 77.50 have the best Effective Communication Ability. Respondents with a bachelor's degree education level of 76.83 also have the highest digital cooperation abilities. Respondents with a junior high education level of 69.27 and a senior high education level of 79.29 came next.

Sidoarjo residents are impressed with the digital presence, scoring it 73.35 for respondents with bachelor's degrees, 66.30 for respondents with high school degrees, and

61.74 for respondents with junior high school degrees. Respondents with a bachelor's degree education level of 84.93, high school education level of 83.79, and junior high education level of 77.78 also have the highest critical and evaluative thinking abilities.

The responders who were undergraduate students scored 82.94 on the originality scale, while junior high school students scored 82.44 and seniors scored 80.43. Respondents with a bachelor's degree education level of 84.17, junior high school of 83.33, and senior high school of 83.15 also have the greatest effective practical skill ability. Respondents with a high school education level of 84.18 had the best cultural, social, and ethical capacities, followed by those with undergraduate degree education at 82.19 and those with junior high school education at 76.88. The eight components of digital literacy skills tend to be owned by respondents with an undergraduate level of education. However, the bachelor's degree respondent has a low index on cultural, social, and ethical abilities, which is below the respondent with a high school level of education.

Digital literacy is one of the things that is crucial today. The higher our digital literacy, the greater the opportunity we can get to develop. Based on the test and calculation results, overall digital literacy in Sidoarjo Regency is 80.83 in the very good category. In addition, if viewed based on the level of education, whether junior high school, high school, or bachelor's degree, the people of Sidoarjo Regency are in a digital literacy condition with an index value above 75. This means that the people of Sidoarjo Regency are ready for massive information and communication technology changes.

Numerous advantages can be attained from the eight components that Sidoarjo Regency uses as a benchmark for assessing digital literacy levels. The surrounding community can choose from these and put them into practice. This statement follows the results of the study (Naufal, 2021; Zam, 2021; Nurrahmah, 2021; Princess et al., 2022; Rachmaningsih et al., 2022; Reddy et al., 2020). Besides that, with good digital literacy conditions, people will not be easily influenced by outsiders but can accept differences with an open attitude and understand the purpose of digital literacy. These results follow the study (Yuniarto & Yudha, 2021) which states the importance of digital literacy in forming solid characters.

The results of the Sidoarjo regency's excellent digital literacy index also do not contradict the research of Hastini, Fahmi, and Lukito, which stated that good digital literacy would produce a quality society with the characteristics of having good communication skills, collaborating, and thinking critically, creatively, and innovatively (Hastini et al., 2020). By recognizing any information it grows, the digital age must be regarded seriously to deal with the many issues and concerns (Suri, 2019).

4. CONCLUSION

According to the study's findings, digital literacy measurements have an average value of 80.83, which falls into the excellent category according to the digital literacy index. In connection with this, the people of Sidoarjo Regency are very good in terms of their capacity to find, select, and analyze information; their ability to collaborate; their openness to accepting digital presence; their capacity to think critically and evaluatively; their capacity for creativity; their capacity for effective practical skills; and their capacity for cultural, social, and ethical values that can be advantageous to the people of Sidoarjo Regency in their daily lives.. The ability to think critically and evaluatively (84.66) is the highest ability possessed by the people of Sidoarjo. In Sidoarjo Regency, the digital literacy index at the junior high school level is 76.35, compared to the

bachelor's degree level of 81.17, the high school level of 79.19, and the digital literacy index at the high school of 79.19.

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