JURNAL PENDIDIKAN TEKNOLOGI INFORMASI DAN VOKASIONAL
http://jurnal.fkip.unila.ac.id/index.php/JPVTI
Vol.3 , No.2 , 2021, 110-117 | e-ISSN 2715-9647 | p-ISSN 2720-9091

ANALYSIS OF DIGITAL LITERACY OF PROSPECTIVE SCIENCE TEACHER STUDENTS IN ONLINE LEARNING

Margaretha Carolina Sagala[1], Ismi Rakhmawati[*2], Nina Kadaritna[3]
[1]Pendidikan Teknologi Informasi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lampung
[2]Pendidikan Biologi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lampung
[3]Pendidikan Kimia, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lampung
[*]e-mail: ismi.rakhmawati@fkip.unila.ac.id

ABSTRACT

The Covid-19 pandemic condition makes lectures conducted online learning which requires students to use digital devices for a long time and access various websites and platforms that support learning. This situation of course affects the digital literacy of students. In this study, we analyse digital literacy competencies included information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. Data were obtained by using questionnaires and lecture observations in vclass involving 43 students of science teacher candidates. The results of the study showed that the digital literacy criteria of students were 58% good and 42% very good with the highest competence in information and data literacy while the lowest was the programming indicator. On average, students spend more than 4 hours using digital devices which were dominated for learning activities and social media.

Keywords*: learning, online, digital literacy, digital devices*

INTRODUCTION

In this 2021 pandemic condition, distance education is still an obligation to be implemented by educational institutions. The distance education implemented is online learning that uses digital technology and virtual classes. In higher education, learning is carried out by recording teaching on an online platform so that quality learning is carried out (Abdulsattar, Alkubaisi, Al-saifi, Al-shidi, & Al-shukaili, 2021). Students use digital technology for synchronous lecture activities using zoom or google meet, reading learning resources from websites, practicum simulations by accessing virtual laboratories, or discussing with colleagues in discussion forums. The variety of technologies facilitates the implementation of online learning and is still an alternative for providing education to prevent the transmission of the Covid-19 virus.

Lecture activities are carried out online at home, so that they require students to be skilled in using digital devices that support the learning process even though students' digital literacy is different. Digital literacy is very important in online learning, especially in using the learning management system (LMS) provided by the campus, searching for information, as well as using various learning platforms. Internet-based LMS can make it easier for educators to manage material distribution, assignments, communication, and other instructions in learning (Abu Shawar & Al-Sadi, 2010). LMS provides various facilities for students in online learning, including course

profiles, structured topics, learning materials, quizzes, video conferences, discussion forums, assignments, and other activities. In completing assignments and deepening the material, students can search for information (browsing and searching) accurate and reliable data from various websites. In addition, in lectures, they often use Android applications such as inaturalist and website applications such as quizizz, phet simulation, and Genedig.

The media used in learning as an intermediary in conveying information between educators and students so as to create real learning conditions and make it easier for students to understand the material and obtain problem solving solutions. Learning media that can improve student learning outcomes are interesting, clear, varied, and interactive media. Educators must of course choose the right media used in online learning, for example, suitability with the subject matter, audio-visual types for various learning styles of students, ease of access, such as virtual classrooms and YouTube, practical age-appropriate, cost-effectiveness, valid and quality sources such as journals and books. official website. Educators need solutions to overcome the shortcomings of learning from home to further improve the reciprocal relationship between educators and students by optimizing digital devices (Nasution & Nasution, 2021).

The use of digital devices in learning is usually equipped with supporting facilities such as wifi or internet quota. This facility makes it easier for students to access materials and learn anywhere and anytime. During the pandemic, the government and institutions collaborated with providers to provide quota subsidies for students and wifi services on campus were also expanded and improved to facilitate online lectures. This condition affects the learning environment that used to refer to the physical location and context, now coupled with information and communication technology that provides virtual education. The learning environment is of course adapted to the situation and conditions to achieve learning objectives, for example by completing virtual classes with greetings, quotes, materials, ice breaking, and practical simulations. However, often the use of digital devices has a negative impact on students such as sleeping during video conferences, task plagiarism, social media distraction and hoax information, being less active, and having difficulty focusing. This impact can be a problem in online learning even though it is hoped that students will be able to use technology, access digital information, create digital content and maintain the security of their respective data which is included in digital literacy.

Digital literacy is the ability to access, understand, integrate, evaluate, and create information safely and appropriately through digital technology, including computer literacy, ICT, information literacy, and media literacy competencies (UNESCO, 2018). The basic digital literacy skills possessed by students are the ability to find and retrieve information from the internet and use it effectively to fulfill learning tasks (Nahdi & Jatisunda, 2020). Digital literacy refers to the ability to understand and use digital-based information. Digital literacy area competencies include information and data literacy, communication and collaboration, digital content creation, safety, and problem solving (UNESCO, 2018). The attitudes and perspectives of digital information users have a significant relationship with the quality of the use of digital resources which are influenced by the digital literacy of students (Nurjanah, Rusmana, & Yanto, 2017).

Students must have excellent digital literacy to understand and use digital information sourced from around the world in various formats. Today's digital world makes it very easy for students to browse videos, audio recordings, e-books, research articles, digital libraries, databases, tutorials, and even digital laboratories. Students must be able to evaluate appropriate data, information, or digital content for problem solving and task completion. In addition, data storage management is important to be carried out in an organized manner. Student communication in the digital world must also conform to norms and not violate Law Number 11 concerning Information and

Electronic Transactions (UU ITE), including content creation which usually has copy rights and licenses. Digital literacy that is not good will certainly have a negative impact on the professionalism of prospective teachers. For this reason, this research is focused on analyzing the digital literacy of prospective science teacher students.

METHOD

This research is a longitudinal survey type survey to find out temporary issues with periodic data collection which will continue in the next academic year. The survey was carried out to obtain data as an overview that is useful for revealing facts that occur in the field and as a basis for preparing lesson plans for the coming school year. The survey was conducted on part of the population of prospective science teachers from 3 undergraduate study programs using purposive sampling technique, the research sample was 43 students of 4th semester Biology Education who took the Invertebrate Zoology course. The research lasted for 6 months which included planning, lecture observations, questionnaire surveys, and data analysis.

The research instrument is a digital literacy questionnaire using a framework (UNESCO, 2018) which consists of 5 area competencies and adapted into 35 statement indicators. Digital literacy competencies include information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. The data were analyzed using the percentage formula and then categorized based on the criteria of very good, good, sufficient, not good, and not good. The data for each indicator is also analyzed with a percentage formula to determine the distribution of students' digital literacy competencies. In addition, the questionnaire is also equipped with questions about the activities that students do while using digital devices and the duration of their use.

RESULTS AND DISCUSSION

In this study, we analyzed student digital literacy using 35 indicators from 5 main competencies. Most students use digital devices for more than 4 hours (Figure 1) and no student accesses digital devices for less than 1 hour. Students usually use digital devices such as laptops and cellphones for learning activities and social media (Figure 2), but students still use less proportion to gain knowledge through seminars, news, and research journals. Technology has many roles and benefits in the world of education during distance learning today (Habibah, Salsabila, Lestari, Andaresta, & Yulianingsih, 2020). Although cellphones make it easier for students to learn, they also have an impact on learning behavior, for example using cellphones to send messages during video conferences and having difficulty focusing while studying (Laka, 2018). This can be handled by the role of parents and educators by reminding them.

The duration of the use of digital devices is in accordance with the current online lectures using virtual classes (vclass.unila.ac.id) for the distribution of each meeting topic. Lectures are also carried out synchronously using Google Meet which has been integrated with vclass. Google Meet used in online learning can activate students who were previously less active in class, flexible in terms of time and place, and provide a varied learning experience for students (Juniartini & Rasna, 2020). Lecturers also provide material, assignments and discussion forums through vclass so that student activities are dominantly carried out online and involve digital devices. In fact, in independent practicums, IOS or Android-based inaturalist applications are used to take photos of Invertebrate species so that they can automatically identify the species name, classification, and location of the animal.

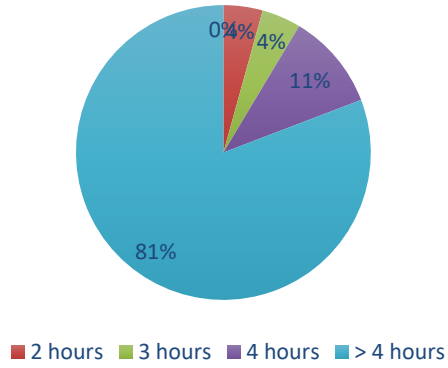

Figure 1. Duration of use of digital devices.

Students' digital literacy falls into two categories, namely very good (42%) and good (58%) (Figure 3). This shows that students have a good ability to get information, data, and digital content precisely as needed. The habit of students to get information by reading both online and offline will help them to be critical of a problem and independence to solve problems (Anisa, A. A. Ipungkarti, & K. N. Saffanah., 2021). In addition, students can interact and collaborate well with colleagues and educators through digital media, although sometimes there are students who are not polite when contacting lecturers and education staff. The lack of interaction between educators and students in e-learning can hinder the achievement of learning objectives (Putri, 2013). There is a need for innovation and planning of interactive learning methods so that students can interact actively and make it easier for students and access the internet (Hidayah & Hadiyanto, 2021).

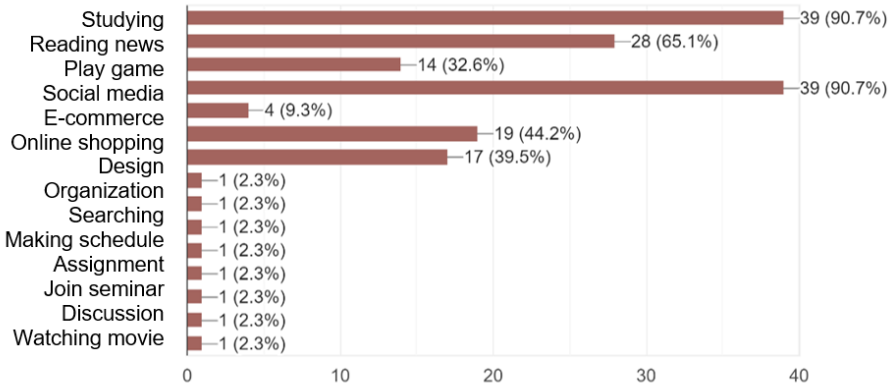

Figure 2. Student activities when using digital devices.

Students can also create good digital content by making video presentations of project results that are equipped with text, transitions, and audio. Although the presentation media used by several groups is still dominated by text, an attractive presentation should use short text, pictures, graphs, tables, and charts. The ability of students to analyze media content is not very good and the ability to communicate through the media is still limited because the majority do not understand the use of gadgets correctly and optimally (Kurniawati & Baroroh, 2016). The ability to create digital content has also been shown by several students in their projects to create media content and applications for Invertebrates, although they are still few and simple. Whereas content that is

informative, inspiring, and has use value is positive content that can overcome the adverse effects of the virtual world of students (Rahmawan, et al, 2019).

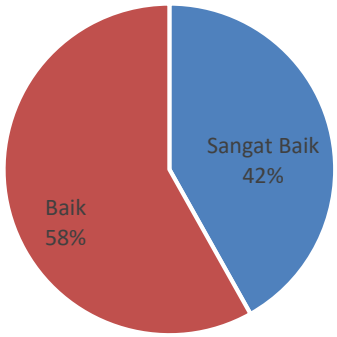

Figure 3. Student digital literacy based on criteria.

Student digital literacy self-assessment data from each indicator in Figure 4 shows that students are very good at acting according to digital norms, for example not bullying, not saying rude things, not cursing in the virtual world, and posting polite content. This is also supported by the attitude of students to maintain a reputation in the digital world which is in the very good category. Climate school plays a very important role in creating learning conditions or virtual classes with nuances that are in accordance with the ITE Law to prevent cyber bullying and students to be polite at every opportunity (Nurhadiyanto, 2020). Students are also very good (Figure 4) in knowing the information needs in accordance with student activities when using the most dominant gadget, namely learning. Technological developments require students to be skilled in using, evaluating, assessing, utilizing various data and information in a digital environment with appropriate technology to support the lecture, daily, and social processes (Cahyani, Ilhamsyah, & Mutiah, 2021).

Students know their need to search for information according to the given task, for example the search for research articles related to the task of discovering new species and using the latest Invertebrates. In connection with this ability, students can access credible sites such as the websites of the accredited journal Sinta or Scopus. Knowledge of journal access has been obtained by students in the Information and Communication Technology-Based Learning Course (PBTIK) which was obtained in the first year of study. Students as the millennial generation need to be equipped with adequate digital literacy because almost all information that is used as a source of learning and the learning process in higher education is widely available in the digital environment and especially excellent digital literacy will open up wide opportunities apart from academic needs (Rahmadi & Hayati, 2020).

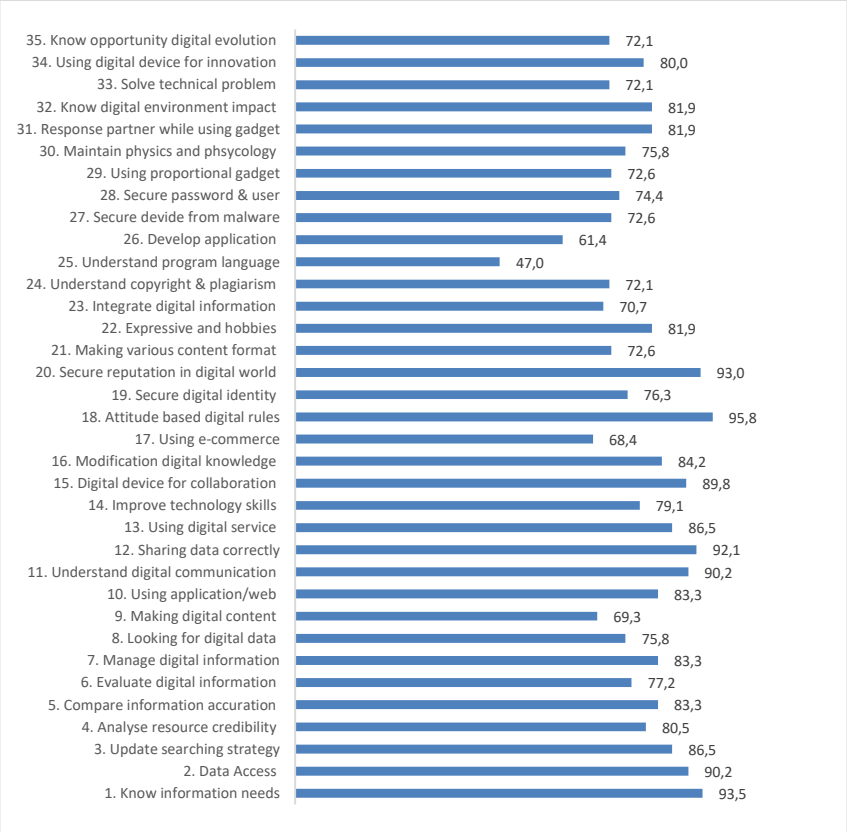

Figure 4. Student digital literacy on each indicator.

Science teacher candidates have excellent data sharing skills (Figure 4), making it easier for them to work on assignments in groups and collect assignments, for example using Google Drive with data links to share and video links for Invertebrate project presentations that have been uploaded via YouTube. In using gadgets, students have very good knowledge about the impact of using digital devices on the environment, for example technology-based learning media that can make the learning atmosphere more fun and technology can be used for animal conservation needs by using inaturalist applications that can detect animal species and locations. Currently students use digital devices with high intensity which of course affects their physical and mental health, students can maintain physical and psychological health well but can respond to colleagues very well when using gadgets.

CONCLUSION

Digital literacy is very important in online learning because learning process used online platform, they searched online for finishing assignment, discussion and explanation using video conference, and other activity. Prospective science teacher students have good and very good criteria of digital literacy with the highest competence of information and data literacy, while the lowest competency is programming. Digital literacy is certainly very important to be improved in all its competencies to make it easier for students to achieve better learning outcomes and become an important skill to enter the world of work.

REFERENCES

Abdulsattar, G., Alkubaisi, A. J., Al-saifi, N. S., Al-shidi, A. R., & Al-shukaili, Z. S. (2021). *The Quality of Selected Online Learning Platforms and Their Effect on Education in the Sultanate of Oman*. *2021*.

Abu Shawar, B. A., & Al-Sadi, J. A. (2010). Learning management systems: Are they knowledge management tools? *International Journal of Emerging Technologies in Learning*, *5*(1), 4–10. https://doi.org/10.3991/ijet.v5i1.887

Anisa, A. R., A. A. Ipungkarti, D., & K. N. Saffanah. (2021). Pengaruh Kurangnya Literasi Serta Kemampuan Dalam Berpikir Kritis Yang Masih Rendah Dalam Pendidikan Di Indonesia. *1st National Conference on Education, System and Technology Information*, *01*(01), 1–4.

Cahyani, V., Ilhamsyah, I., & Mutiah, N. (2021). Analisis Tingkat Literasi Digital pada Generasi Z dengan Menggunakan Digital Competence Framework 2.1 (Studi Kasus: Mahasiswa FMIPA UNTAN). *Coding Jurnal Komputer Dan Aplikasi*, *9*(1), 1–11. Retrieved from https://jurnal.untan.ac.id/index.php/jcskommipa/article/view/43917

Habibah, R., Salsabila, U. H., Lestari, W. M., Andaresta, O., & Yulianingsih, D. (2020). Pemanfaatan Teknologi Media Pembelajaran di Masa Pandemi Covid-19. *Trapsila: Jurnal Pendidikan Dasar*, *2*(02), 1. https://doi.org/10.30742/tpd.v2i2.1070

Hidayah, M. &, & Hadiyanto, S. (2021). KAJIAN INTERAKSI DAN PERANAN MEDIA SOSIAL DALAM PEMBELAJARAN DARING MAHASISWA PADA ERA PANDEMI. *Jurnal Pengetahuan Ilmu Sosial Indonesia*, *6*, 27–33.

Juniartini, N., & Rasna, I. (2020). Pemanfaatan Aplikasi Google Meet Dalam Keterampilan Menyimak Dan Berbicara Untuk Pembelajaran Bahasa Pada Masa Pandemi Covid-19 1Nme. *Jurnal Pendidikan Dan Pembelajaran Bahasa Indonesia*, *9*(2), 133–141.

Kurniawati, J., & Baroroh, S. (2016). Literasi Media Digital Mahasiswa Universitas Muhammadiyah Bengkulu. *Jurnal Komunikator*, *8*(2), 51–66. Retrieved from https://journal.umy.ac.id/index.php/jkm/article/download/2069/2586

Laka, B. M. (2018). Dampak Penggunaan Handphone Terhadap Perilaku Belajar Peserta Didik Di Sma Yayasan Sub Byaki Fyadi Kabupaten Biak Numfor. *PEDAGOGIKA: Jurnal Pedagogika Dan Dinamika Pendidikan*, *6*(2), 58–78. https://doi.org/10.30598/pedagogikavol6issue2page58-78

Nahdi, D. S., & Jatisunda, M. G. (2020). Analisis Literasi Digital Calon Guru Sd Dalam Pembelajaran Berbasis Virtual Classroom Di Masa Pandemi Covid-19. *Jurnal Cakrawala Pendas*, *6*(2), 116–123. https://doi.org/10.31949/jcp.v6i2.2133

Nasution, M. R., & Nasution, L. S. (2021). Konsep Pendidikan Mobile Learning: Layanan Konseling. *Journal of Digital Learning and Education*, *1*(2), 62–71. https://doi.org/10.52562/jdle.v1i2.238

Nurhadiyanto, L. (2020). Analisis Cyber Bullying Dalam Perspektif Teori Aktivitas Rutin Pada Pelajar SMA Di Wilayah Jakarta Selatan. *IKRA-ITH Humaniora*, *4*(2), 113–124. Retrieved from https://core.ac.uk/download/pdf/270194229.pdf

Nurjanah, E., Rusmana, A., & Yanto, A. (2017). Hubungan Literasi Digital dengan Kualitas

Penggunaan E-Resources. *Lentera Pustaka: Jurnal Kajian Ilmu Perpustakaan, Informasi Dan Kearsipan*, *3*(2), 117. https://doi.org/10.14710/lenpust.v3i2.16737

Putri, R. E. (2013). Model Interaksi Dalam E-Learning. *Seminar Nasional Informatika 2013/SemnasIF2013*, *2013*(semnasIF), 209–214.

Rahmadi, I. F., & Hayati, E. (2020). Literasi Digital, Massive Open Online Courses, dan Kecakapan Belajar Abad 21 Mahasiswa Generasi Milenial. *Jurnal Studi Komunikasi Dan Media*, *24*(1), 91. https://doi.org/10.31445/jskm.2020.2486

Rahmawan, D., Mahameruaji, J. N., & Anisa, R. (2019). Pengembangan konten positif sebagai bagian dari gerakan literasi digital. *Jurnal Kajian Komunikasi*, *7*(1), 31. https://doi.org/10.24198/jkk.v7i1.20575

UNESCO. (2018). A Global Framework of Reference on Digital Literacy. *UNESCO Institute for Statistics*, (51), 146.