

## Digital literacy scale of English pre-service teachers and their perceived readiness toward the application of digital technologies

Khaira Liza, Erna Andriyanti

English Education Department, Yogyakarta State University, Indonesia

### Article Info

#### Article history:

Received Aug 17, 2019

Revised Nov 08, 2019

Accepted Nov 20, 2019

#### Keywords:

Graduate school students

Mixed-methods

Pre-service teachers

Professional teachers

### ABSTRACT

High digital literacy is significantly needed by English teachers in the trend of industrial revolution 4.0 to promote a better quality of English teaching and learning. However, a significant number of English teachers, as well as pre-service teachers, still had low digital literacy scale and they were not ready to implement digital technologies into English teaching and learning process. This study was aimed to describe the digital literacy scale of graduate school students of English Education Department in a state university in Yogyakarta as pre-service teachers and their readiness toward the application of digital technologies in teaching and learning contexts. The research used mix-methods to collect both quantitative and qualitative data through Likert-scale questionnaires and interviews. The study revealed that the research participants had high digital literacy scales and readiness toward the application of digital technologies. Thus, those graduate school students as pre-service teachers could fulfill the requirements of professional English teachers in terms of digital literacy and improve the quality of English teaching and learning output by integrating digital technologies.

*This is an open access article under the [CC BY-SA](#) license.*



### Corresponding Author:

Khaira Liza,

English Education Department,

Yogyakarta State University,

Jl. Colombo No. 1 Karang Malang, Caturtunggal, Depok, Sleman, D.I. Yogyakarta, 55281, Indonesia

Email: [khairaliza.2017@student.uny.ac.id](mailto:khairaliza.2017@student.uny.ac.id)

## 1. INTRODUCTION

Digital literacy has been a prevalent issue among language researchers since the fourth Industrial Revolution (IR 4.0) era was born with the rapid growth of digital technology and information and communication technology (ICT) in the last decade [1-5]. Digital literacy is the ability to access, organize, understand, evaluate information that include multimodal outlook through digital technologies [6-8], and engage in the rapid growth of the digital communication channel by interpreting, managing, sharing and creating meaning [9-12]. The skills included in digital literacy encompass the competence to analyze information critically so called information literacy [13, 14], interpret visual media known as visual literacy [15, 16], operate digital contents or software literacy [17], and utilize computers and technologies [18-22]. English teachers in the IR 4.0 era are expected to have high digital literacy scale and readiness toward the application of digital technologies as an effort to fulfill the necessities of millennial or digital native generation in the classroom. This generation grew up or live with the loads of digital technology invention and they always keep in touch with digital technologies [23, 24]. Hence, the teachers are required to integrate digital technology into English teaching and learning process. Many studies have shown the benefits of utilizing digital technologies to improve students' English proficiency [25-29], for instance, creating effective learning

through social networks application [30-33] and establishing learning motivation among the students [34, 35]. However, many English teachers in some Asian countries, including Indonesia, still have low digital literacy scale. Some studies claim that mostly teachers only use digital technologies related to technical things (e.g. operating computer, projector, speakers, camera, recorder. etc) [36, 37] as teaching preparation due to lack of knowledge and skills [38-40]. This competence is categorized as the lowest level in Bloom's digital taxonomy [41]. As a consequence, it would influence their readiness toward the application of digital technologies in teaching. This present study was conducted to fill the gap of research need in this area. It was concerned with pre-service English teachers' digital literacy scale and their readiness to integrate digital technology to teach.

Teachers' constraints to deal with digital literacy in English teaching process can be reduced if pre-service teachers or students of English Education study program are well-equipped with digital literacy skills. By having sufficient trainings, they would gain high digital literacy scale. It is one of the strategies to yield qualified teachers in this 21<sup>st</sup> century. A number of researchers conducting studies related to digital literacy scale measurements and teachers' readiness to engage in technological-based teaching and learning used their own and adapted models as the instruments [42-45].

This present study adapted the model of digital literacy scale by Rokenes and Krumsvik [46], which was considered adequate to describe the digital literacy scale. Meanwhile the readiness toward technological applications of the teachers was measured by considering various factors such as perception, attitude, motivation, and their ability [47, 48]. Even though studies found that teachers had positive perception and motivation in implementing technologies into English teaching, these perception and motivation did not reflect their abilities in utilizing technologies [38, 42, 46]. Furthermore, the studies related to graduate school students' digital literacy level and their readiness to integrate digital technology into English learning is still rare in Indonesia. Previous studies only investigated how student teachers used technology for learning and the kinds of technology they preferred to integrate in learning [49].

## 2. RESEARCH METHOD

This study used a descriptive mix-methods design [50]. The quantitative data of students' digital literacy scale were collected through Likert-scale questionnaires adapted from Rokenes and Krumsvik [46]'s scale. This study only used fifteen out of 39 items of the original items. The adaptation of digital literacy skills scale was realized by adding demographic items about participants' age, gender, and education background, and by using 5-point Likertscale (from 1= very low to 5= very high). The questionnaire was valid, measured through moment product correlation, with all of the items have more than 0.05 level (2-tailed) of significant correlation. Its reliability was shown by Cronbach Alpha Correlation of 0.835. The qualitative data were collected through structured-interview with fifteen students.

The questions included their perception and attitudes toward digital technology applications, knowledge of digital technology application, and ability in using digital technologies. The interview protocol was developed with assistance of professional academicians and adaption model of Kisanjara [47]. Both quantitative and qualitative data were analyzed descriptively through reduction, display, and conclusion [51]. The research participants were 54 English students of graduate school in a state university in Yogyakarta, consisting 39 females and 15 males. Based on purposive sampling, they were chosen because they had been using technology more than 10 years. Their age ranged 23-33 years old. The data were collected during the end of the fourth semester of the 2108/2019 academic year.

The questionnaires were administered by using Google forms. The participants were sent the link of the forms through their Whatsapp account. The data collection process lasted approximately for two weeks. The interview was conducted face to face and via phone call. Both types of data were analysed in descriptive statistics and interpreted qualitatively.

## 3. RESULTS AND ANALYSIS

The finding of the students' digital literacy scale shows that the total mean score of all items is 58.12. The range of the mean score is 3.33- 4.30. Among fifteen items, there were four items (number 11-15) in which the students achieved mean scores greater than 4 scale, categorized as high. The highest was item number 15, related to photos and videos editing with the mean score 4.30. It is followed by item number 14 about their ability in using video-call and video conference with the score 4.17, item number 12 related to their ability in installing digital technology devices by the mean score 4.15, item number 13 related to their ability in downloading and saving files from websites by the mean score 4.13, and item number 11 related to their skill in interpreting visual, audio, and audio-visual media. The range score of items 1-10 was 3.33-3.98. The ability in solving technical problems of digital technology devices was the highest among those ten items

by the mean score 3.98. It is followed by the mean score of their ability in installing application and their skills in using word processing, power points, web-search, multimedia, and communication application by the mean score 3.85. These were higher than their perception about their own digital literacy skills by

the mean score 3.80. The mean score of their ability in using application (3.76) was higher than the items that had similar score (3.74) that related to their frequency in using internet, computer, multimedia, and social networks in a week, and their knowledge related to digital technology issues. The item related to their ability in organizing and evaluating information (3.65) was higher than their knowledge about digital technology devices (3.59) and ability in analyzing information (3.33). The data is presented in Table 1.

Table 1. The rating of digital literacy scale

Item	Mean
1. The rate of digital literacy skills.	3.80
2. The frequency of internet, computer, multimedia, and social networks use in a week.	3.74
3. The rate of skills in using the word processing, power points, web search, multimedia, and communication application.	3.85
4. The rate of knowledge related to digital technology issues.	3.74
5. The rate of ability in organizing and evaluating information.	3.65
6. The rate of ability in analyzing information.	3.33
7. The rate of ability in solving technical problems of digital technology devices.	3.98
8. The rate of ability in using the applications.	3.76
9. The rate of ability in installing applications.	3.85
10. The rate of knowledge about digital technology devices.	3.59
11. The rate of ability in interpreting visual, audio, and audio visual media.	4.09
12. The rate of ability in installing digital technology devices.	4.15
13. The rate of ability in downloading and saving files from web-sites.	4.13
14. The rate of ability in using video-call or video conferencing tools.	4.17
15. The rate of ability in creating and editing photos and videos.	4.30
Total	58.13

The finding of the students' readiness toward the application of digital technologies into English teaching that represent the four constructs (perception, knowledge, attitude, ability) indicates that their readiness was high. 78 % of the students articulated that they were ready to apply digital technologies into English teaching. Most of them stated in the interview that they chose laptop, smartphone, the internet, and YouTube as digital technologies that would be applied. 22 % of the students thought they were not ready to integrate digital technologies into English learning due to the limited number of digital technologies provided by the schools and lack of skill and knowledge of digital technology. In term of the advantages of using digital technologies into English learning toward sources of learning materials, all of them believed that through digital technologies, teacher could get various learning materials fast, easily, and efficiently. They also agreed that digital technologies encouraged teachers to be creative. From their experiences and literatures, they were sure that the students were motivated to learn through digital technologies. Almost all of interviewee stated that one of the strategies to have good digital literacy skills was learning independently by searching the information from internet through Google or YouTube, sharing with partners or teachers, joining workshops or training programs, and practising it. Realizing that the importance of digital technologies for pre-service teachers, from the interview found that there were five things that they wanted to learn: using and designing application, creating attractive slides, creating games and quiz, creating digital media such as pictures, videos, and animation, and computer programming. In learning new digital technologies or applications, 93 % of participants chose to learn it independently through internet or YouTube, followed by asking friends or specialists. From their answers also found that they actively used digital technologies in their daily lives, particularly in five major activities, namely : communication activities by using social media such as Whatsapp, Facebook, Twitter, Instagram, and e-mail; searching for information or news; reading books and articles; watching movies or videos and listening musics; and playing games. Mostly (93 %), they also utilized internet to know the current digital technologies for teaching, and 7 % of respondents chose to join some conferences.

The high digital literacy scale of the students found in this study has been predicted by Buckingham and Willet [23] due to their characteristics. Their age ranging indicated that they were categorized into millennial or digital generation since they were born during 1980s-1990s [24]. Buckingham and Willet [23] claimed that this generation has high digital literacy scale since they were grown during

the loads of digital technologies inventions. It made them had sufficient knowledge and skills of digital technologies since their young ages. Their good knowledge about the devices, applications, terminologies, and technical things related to digital technologies was caused by their high enthusiasm to digital technologies. It was proven by their high frequency in using internet, computer, multimedia and social

networks in a week to read articles, news, and books. The result is in line with the study of Ata and Yildirim [52], in which they found pre-service teachers had high and positive perception about digital literacy.

They articulated their enthusiasm in digital literacy by keeping update with innovation, processing information, using technological tools, finding, verifying and sharing information, using digital media effectively, using the internet effectively, writing and reading language programming, and using the technology in the right place and time. Their positive attitude was also proven by the high frequency of internet use in a week. Although gender difference did not matter in perceptions of digital literacy skills, males were expected to be aware of digital literacy. It is also in accordance with the finding reached by Ustundag et al [53] in the study to pre-service teachers in 13 state universities in Tehran. The research participants had high digital literacy skills. They were qualified enough in learning new technologies and collaborating with partners via ICT, web-based activities, solving technical problems, and utilizing internet connection for their own university work.

The result of the students' readiness toward application of digital technology into English learning that consists of four constructs (perception, knowledge, attitude, ability) as revealed by Kisanjara [47] had supported the finding of quantitative data. The good knowledge and ability of digital literacy implied that they had positive perception and attitude toward digital technologies. The research participants argued that English teachers could develop and enhance their creativities with the assistance of digital technologies through various learning applications such as Hot Potatoes, Ruang Guru, and Elsa. They also recommended some websites such as YouTube, BBC, Edmodo, etc that could be implemented for English teaching and learning, as also found in Fitriah' study [36]. The respondents stated that the emergence of digital technologies in their lives brought positive impacts to teaching and learning process. It is in line with the study of Dang and Nguyen [34], Durriyah [48], Munawarah [25], and Ngo and Eichelberger [35], in which the respondents had positive perception and attitude about the implementation of digital technologies into English teaching and learning contexts. They believed that digital technologies could help them develop learning materials and create fun learning environment. Then it encouraged them to keep learning and improve their knowledge and ability about digital technologies. In certain cases, positive perception is not always in line with the ability in using digital technologies, such as in the study of Rokenes and Krumsvik [46]. It was found that the positive perception of the teachers about digital technologies was not equal to their ability in utilizing the technological devices due to limited knowledge and skills. As a result they were not ready to apply technological devices in the classroom. The study of Razak, Alakrash, Sahboun [54] also found that the English teachers were not ready to applicate technology into English teaching due their understanding and attitude of technology and obstacles in using technology.

#### 4. CONCLUSION

The result reveals that the students had high digital literacy scale and perceived readiness toward the application of digital technology into English teaching and learnig. They also articulated that digital technologies brought various advantages to develop teachers' creativities, learning materials and motivation. It encouraged them to improve their knowledge and skills in digital technologies. These are the expected requirements of English teachers in this era. They had fullfilled the requirement of professional English teachers in term of digital literacy. A further study investigating pre-service's ability to implement their digital literacy skills in real English instructional settings need to be done. All findings related to the current study and later studies can be considered by policy makers in designing English curriculum.

#### REFERENCES

- [1] Hartley, J., *The use of digital literacy*, New York. Routledge, 2009
- [2] White, J., *Digital literacy skills*, California: Sage, 2015.
- [3] Ilomaki, L., Paavola, S., Lakkala, M., and Kantosala, A., "Digital competence- an emergent boundary concept for policy and educational research," *Education and Information technologies*, vol. 21, no. 3, pp. 655-679, 2016.
- [4] Mishra, K. E., Wilder, K., and Mishra, A. K., "Digital literacy in the marketing curriculum: Are female college students prepared for digital jobs?," *Industry and Higher Education*, vol.31, no. 3, pp.204-211, 2017.
- [5] Spante, M., Hashemi, S. S., Lundin, M., and Algers, A., "Digital competence and digital literacy in higher education research: Systematic review of concept use," *Cogent Education*, vol. 5, no. 1, pp. 1-21, 2018.
- [6] Carrington, V., and Robinson, M. (Eds.), *Digital literacies: Social learning and classroom practices*, California: Sage, 2009.
- [7] Savage, M., and Bernett, A., *Digital literacy for primary teachers*, Northwich: Critical Publishing, 2015.
- [8] Tang, C. M., and Chaw, L.Y., "Digital literacy: A prerequisite for effective learning in a blended learning environment?," *Electronic Journal of E-learning*, vol. 14, no. 1, pp. 54-65, 2016.
- [9] Dudeney, G., Hockly, N., and Pegrum, M. *Digital literacies*, New York: Routledge, 2014.

- [10] Leu, D., Klinzer, C., Coiro, J., Castek, J., and Henry, L., "New literacies: A dual-level theory of the changing nature of literacy, instruction, and assessment," in: D.E. Alverman, N. J. Unrau, Ruddell, R.B. (Eds.) *Theoretical models and processes of reading*, New York: Routledge, 2014.
- [11] Chan, B. S., Churchill, D., and Chiu, T.K., "Digital literacy learning in higher education through digital storytelling approach," *Journal of International Education Research*, vol. 13, no. 1, pp. 1-6, 2017.
- [12] Bennett, E., "Learning from the early adopters: Developing the digital practitioner," *Research in Learning Technology*, vol. 22, pp. 21453-21466, 2014.
- [13] Armstrong, S., and Brunskill, P., *Information literacy: Separating fact from fiction*, Texas: Shell Education, 2017.
- [14] Alewine, M. C. and Canada, M., *Introduction to information literacy for students*, Sussex: John Wiley & son Ltd., 2017.
- [15] Vasquez, J. A., *Developing visual literacy in science, K-8*, Washington: NSTA Press, 2010.
- [16] Elkins, J., *Visual literacy*, New York: Routledge, 2008.
- [17] Khoo, E., Hight, C., and Torrens, R., *Software literacy: Education and beyond*, Singapore: Springer, 2017.
- [18] Jawett, C., *Technology, literacy, learning: a multimodal approach*, New York: Routledge, 2006.
- [19] Dakers, J., *New frontiers in technological literacy: Breaking with the past*, New York: Palgrave Mcmillan, 2014.
- [20] Ng, Wan., *New digital technology in education: Conceptualizing professional learning for educators*, London: Springer, 2015.
- [21] C. Morrison and D. Wells, *Computer literacy basic*, Massachuset: Course Technology, 2013.
- [22] Alwin, D. A, *Computer literacy*, Chennai: Lulu.com, 2017.
- [23] Buckingham, D., and Willet, R. (Eds.), *Digital generations: Children, young people, and new media*. New York: Routledge, 2013.
- [24] Taylor, P., and Keeter, S. (Eds), *Millenials: A portrait of generation next. Confident. Connected. Open to Change*. Washington, DC: Pew Research Center, 2010
- [25] Al-Munawarah, S.F., "Teachers' perceptions on the use of ICT in Indonesian EFL learning context," *English Review: Journal of English Education*, vol. 3, no. 1, pp. 70-80, 2014.
- [26] Ahmadi, D., and Reza, M., "The use of technology in English language learning: A literature review," *International Journal of Research in English Education*, vol. 3, no. 2, pp. 115-125, 2018.
- [27] Alwehaibi, H.O., "The impact of using Youtube in EFL classroom on enhancing EFL students' content learning," *Journal of College Teaching and Learning*, vol. 12, no. 2, pp. 121-126, 2015.
- [28] Arndt, H.L., and Woore, R., "Vocabulary learning from watching Youtube videos and reading blog posts," *Language Learning & Technology*, vol. 22, no. 1, pp. 124-142, 2018.
- [29] Khalaf, A.J. "The effectiveness of using internet in TEFL learning," *Theory and Practice in Language Studies*, vol.8, no.9, pp. 1114-1121, 2018.
- [30] Al-said, K.M., "Students' perceptions of Edmodo and mobile learning and their real barrier toward them," *Turkish Online Journal of Educational Technology-TOJET*, vol. 14, no. 2, pp. 167-180, 2015.
- [31] Balasubramaniana, K., Jaykumar, V., and Fukey, L.N., "A study on student preference towards the use of Edmodo as a learning platform to create responsible learning environment," *Procedia Social and Behavioral Science*, vol. 144, no.-, pp. 416-422, 2014.
- [32] Janpho, J., Chaeturat, C., and Multa, D., "Enhancing English writing skill by using online social network Edmodo," *Journal of Education, Mahasarakham university*, vol. 3, no. 4, pp. 707-712, 2015.
- [33] Ma'azi, H., and Janfeshan, K., "The effect of Edmodo social learning network on Iranian EFL learners writing skill," *Cogent Education*, vol. 5, no. 1, pp. 1-17, 2018.
- [34] Dang, H. T., and Nguyen, N.H. T., "An exploratory study of ICT use in English language learning among EFL university students," *Teaching English with Technology*, vol. 14, no. 4, pp. 32-46, 2014.
- [35] Ngo, H., Eichelberger, A., "College students' attitude toward ICT use for English learning," *International Journal of Education and Development using Information and Communication Technology*, vol. 15, no. 1, pp. 245-258, 2019.
- [36] Fitriah, "The role of technology in teachers' creativity development in English teaching practice 1," *TEFLIN Journal*, vol. 29, no. 2, pp. 177-193, 2017.
- [37] Dashtestani, R., "EFL teachers' knowledge of the use and development of computer assisted language learning (CALL) materials," *Teaching English with Technology*, vol. 14, no. 2, pp. 3- 26, 2014.
- [38] Hedayati, H., and Marandi, S.S., "Iranian EFL teachers' perceptions of the difficulties of implementing CALL," *RECALL*, vol. 26, no. 3, pp. 298- 314, 2014.
- [39] Muslem, A., Yusuf, Y.Q., and Juliana, R., "Perceptions and barriers to ICT use among English teachers in Indonesia," *Teaching English with Technology*, vol. 18, no. 1, pp. 3- 23, 2018.
- [40] Chaaban, Y., and Ellili-cherif, M., "Technology integration in EFL classroom: A study of Qatari independent schools," *Education and Information Technologies*, vol. 22, no. 5, pp. 2433- 2454, 2017.
- [41] Anderson, L.W., Krathwohl, D.R., *A taxonomy for learning teaching and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Longman, 2001.
- [42] Cam, E., and Kiyici, M., "Perceptions of perspective teachers on digital literacy," *Malaysian Online Journal of Educational Technology*, vol. 5, no. 4, pp. 29-44, 2017.
- [43] Maderick, J.A., Zang, S., Hartley, K., and Marchand, G., "Preservice teachers and self-assessing digital competence," *Journal of Education and Computing Research*, vol. 54, no. 3, pp. 326-351, 2016.
- [44] Kurniawati, N., Maolida, E.H., Anjaniputra, A.G., "Praxis of digital literacy in the EFL classroom: Digital-immigrant vs digital-native teacher," *Indonesian Journal of Applied Linguistic*, vol. 80, no. 1, pp. 28-372, 2018.

- [45] Rodriguez-de-Dios, I., Igartua, J.J., and Gonzales-Vazquez, A., "Development and validation of a digital literacy scale for teenagers," *Proceedings of the fourth international conference on technological ecosystems for enhancing multiculturalism*, ACM, pp. 1067-1072, 2016.
- [46] Rokenes, F.M. and Krumsvik, R.J., "Prepared to teach ESL with ICT? A study of digital competence in Norwegian teacher education," *Computers & Education*, vol. 97, pp. 1-20, 2016.
- [47] Kisanjara, S.B., "Students' attitudes and readiness assessment toward e-learning in e-learning institution," *International Journal of Engineering Research & Technology*, vol. 3, no. 1, 2014.
- [48] Durriyah, T.L., and Zuhdi, M., "Digital literacy with EFL student teachers: Exploring Indonesian students teachers' initial perception about integrating digital technologies into a teaching unit," *International Journal of Education and Literacy Studies*, vol. 6, no. 3, pp. 53-60, 2018.
- [49] Rodliyah, R.S., "Using a Facebook and closed group to improve EFL students' writing," *TEFLIN Journal*, vol. 27, no. 1, pp. 82-99, 2016.
- [50] Nassaji, H., "Qualitative and descriptive research: Data type versus data analysis," *Language Teaching Research*, vol. 19, no. 2, pp. 129-132, 2015.
- [51] Miles, M.B., and Huberman, A.M., *Qualitative data analysis: An expanded sourcebook*. California: Sage Publication Inc, 1994.
- [52] Ata, R., and Yildirim, K., "Exploring Turkish pre-service teachers' perceptions and views of digital literacy," *Education Sciences*, vol. 9, no. 1, pp. 1-16, 2019.
- [53] Ustundag, M. T., Gunes, E., and Bahcivan, E., "Turkish adaptation of digital literacy scale and investigating pre-service science teachers'," *Journal of Education and Future*, vol. 12, pp. 19-29, 2017.
- [54] Razak, N. A., Alakrash, H., and Sahboun, Y., "English language teachers' readiness for the application of technology towards fourth industrial revolution demands," *Asia-Pacific Journal of Information Technology and Multimedia*, vol. 7, no. 2, pp. 89-98, 2018.

## BIOGRAPHIES OF AUTHORS



Khaira Liza was born on December 17, 1989 in Saruaso, West Sumatera. Now, she is studying in the English Department of Graduate School in Yogyakarta State University. Her research interests include communicative competence, digital literacy in language education and High Order Thinking Skills (HOTS).



Erna Andriyanti earned her Ph.D. from the Department of Linguistics at Macquarie University, Australia in 2017. She teaches primarily linguistics subjects, including sociolinguistics, linguistics research methodology, and linguistics research proposal writing at Universitas Negeri Yogyakarta, Indonesia. Her research interest and thesis supervision are predominantly in the areas of sociolinguistics, multilingualism, educational linguistics, and cultural aspects in English language education in Indonesia. She recently presented her papers in: 1) the 15<sup>th</sup> Asia TEFL and 64<sup>th</sup> TEFLIN International Conference (Yogyakarta, July 2017); 2) the *Dialog Kebangsaan* (Sydney, September 2017); 3) the 1<sup>st</sup> International Conference on English Linguistics, Literature, and Language Teaching (ICEL3T) (Yogyakarta, September 2018); 4) The 17<sup>th</sup> Asia TEFL and the 6<sup>th</sup> FLLT International Conference (Bangkok, June 2019); and 5) The 7<sup>th</sup> International Seminar on Languages of Java (Banyuwangi, July 2019). She has also published her research articles in Scopus-indexed journals: Indonesian Journal of Applied Linguistics (in Vol. 9 No. 1, May 2019) and GEMA Online Journal of Language Studies (in Vol. 19 No. 3, August 2019); and in international seminar proceedings by Taylor and Francis Group in 2018 and 2019.