

Analysis Level of Digital Literacy of Digital Natives: How The Impact On Their Self-Regulated Learning?

Syayyidah Maftuhatul Jannah
(iftasyayyidah@gmail.com)

UIN Sunan Kalijaga Yogyakarta, Indonesia

(Diterima: 15 Juni 2019, direvisi: 15 Juli 2019, dipublikasikan : 30 Agustus 2019)

ABSTRACT

This study aims to analyze the level of digital literacy of millennial generation and how it affects their abilities in their learning process (self-regulated learning). Data were obtained through an online questionnaire distributed to students at several universities in Yogyakarta. The number of questionnaires that can be processed is 100 questionnaires. Furthermore, the collected data is then analyzed using Structural Equation Modeling (SEM). The results showed that the level of digital literacy of female students could be said to be higher than that of male students. However, both male and female students have not so high values on the dimensions of critical understanding as one dimension of digital literacy. The results of this study also show that digital literacy has a positive effect on self-regulated learning.

Keywords : *Digital Natives, Digital Literacy, Self-Regulated Learning*

INTRODUCTION

Nowadays, the world is in the era of industrial revolution 4.0 (fourth generation industrial revolution). The emergence of artificial intelligence (AI) and other technologies such as the internet of things, human-machine interfaces, robotic technology and sensors, and three-dimensional (3D) printing technology are signs that in this era, the industry will enter the virtual world and the use of automation machines integrated with the internet network (Widiarini, 2018). One of the effects of implementing these technologies is an increase in productivity and competitiveness. HR who live in this era are demanded to be all tactical, innovative, able to accommodate all needs that can support self-qualifications and competencies, and build independence ("Hakteknas", 2019).

The development of technology in the current era is recognized to facilitate access to information and knowledge (Goulão & Fombona, 2012). This certainly greatly helps increase the competence and quality of human resources through a learning process. But on the one hand, there are also concerns due to the explosion of information without filters, incorrect information, negative content, misuse of information, etc. (Rahmah, 2015). This can be a threat if HR does not have the ability and good understanding of using and managing existing information so that it can influence how they grow and learn. In this case, digital literacy becomes important because it can affect the absorption and management of information related to one's learning process.

Digital literacy is a cognitive process (Greene, Yu, & Copeland, 2014) that includes not only the ability to search information effectively, but also examine and integrate that information for learning purposes (Bråten, Britt, Strømsø, & Rouet, 2011 in Greene et al., 2014). In this case, the process by which someone sets his learning goals and is able to be bound in the process to achieve these goals is termed self-regulated learning (SRL). It can be concluded that digital literacy has an important influence on a person's learning process or experience (Knutsson, Blåsjö, Hållsten, & Karlström, 2012; Prior, Mazanov, Meacheam, Heaslip, & Hanson, 2016). In other words, there is a link between digital literacy and SRL as an important factor to explain a person's learning experience (Bol & Garner, 2011; Broadbent & Poon, 2015; Cho & Heron, 2015; Cho, Kim, & Choi, 2017). The high and low level of one's digital literacy will affect a person's ability to learn (SRL). Especially in an increasingly complex era today, HR is required to not only be smart and master the theory but also have high learning abilities to have competitiveness.

The development of highly competitive human resources has also become the focus of the Ministry of Research, Technology and Higher Education (Kemenristekdikti). By targeting the millennial generation, Kemenristekdikti tries to develop human resources through the implementation of distance learning or online learning (Ira, 2019). Millennial generation itself is a generation that grows and develops in an era of technological and information advancement. Changes in the industrial revolution 4.0 shared by this generation, require them to adapt. Through high learning abilities, millennial human resources are expected to be able to improve their quality to compete and deal with changes so quickly.

Millennials are also called digital natives, namely those born in the digital era so that their daily activities are closely related to technology (Ng, 2012). This generation is also said to have different learning methods from the previous generation so that their ability to embrace technology signifies that they have a certain level of digital literacy (Ng, 2012). However, the fact of the research shows that millennials have difficulty finding, understanding, examining, and integrating information from the internet because they do not have good digital literacy skills (Greene et al., 2014). Based on this, there are contradictions which can be concluded that millennial generation as digital natives actually have low digital literacy and this can adversely affect their ability to manage the learning process (SRL).

The simple concept built in this study is the correlation between millennial generations as digital natives, digital literacy, and self-regulated learning (SRL). Digital natives are a generation born in the digital era and are accustomed to using technology in their daily lives. In simple terms, everyday life that is so close to digitalization leads them to good digital literacy skills that will affect their learning process. However, there are contradictive facts that are found so to create gaps. Based on that, the researchers tried to analyze the relationship between the three things. This study wants to answer the following points: (1) What is the level of digital literacy of millennial generation as digital natives? and (2) What is the influence of digital literacy toward SRL of the millennial generation? Is the higher the level of digital literacy, the higher is SRL, and vice versa?

LITERATURE REVIEW

Digital Literacy

In the current growth of the digitalization of technology and information, internet media is very close and closely related to human resource activities, including the learning process. All information and knowledge are easily accessed (Goulão & Fombona, 2012) so that digital literacy skills can be said to be a key competency in this era (Zhang & Zhu, 2016). The term digital literacy itself comes along with other terms that are also related to technology, including media literacy, Information and Communication Technology (ICT) literacy, ICT competence, digital competence, and others (Zhang & Zhu, 2016). Besides emphasizing on the technical capabilities of ICT, these terms are also related to a variety of cognitive abilities and problem-solving (Zhang & Zhu, 2016). Although the definitions of these terms can be said to overlap each other, actually each term builds its own assumptions and relationships that are more specific to technology (Zhang & Zhu, 2016). This research uses digital literacy or digital media literacy, where the direction is not only a matter of mastering the technical capabilities of ICT, but also the ability of high-order learning processes. In a digital context, one of the capabilities that signifies high-order learning processes is the ability to evaluate information obtained through digital media. Greene, Yu, & Copeland (2014) add that digital literacy has two important aspects, including (1) the ability to plan and monitor strategies used to search for and manage information wealth obtained online, and (2) ability to examine (evaluate) and integrate the information obtained correctly. Another pressing point from several other studies is that digital literacy is a process of managing information for a learning goal. So that in digital literacy, the process is not enough just to search, examine, and integrate information, but further to make meaning in the learning (Greene et al., 2014).

Another more complex definition is expressed by Martin (2006) in Prior et al. (2016), where digital literacy is defined as awareness, attitudes, and the ability of individuals to use digital tools and facilities to identify, access, manage, integrate, evaluate, and synthesize digital sources, communicate with others, and build new knowledge. Martin (2006) in Prior et al. (2016) added that one of the important components of digital literacy is related to a person's ability to obtain, understand, and use his knowledge appropriately. In addition, several studies have also been found to help develop various components or dimensions of digital literacy, such as Rahmah (2015) dan Zhang & Zhu (2016).

Rahmah (2015) stated that digital literacy covers three dimensions, namely technical, cognitive, and socio-emotional. The technical dimension relates to how to use and interact with digital technology media. The cognitive dimension relates to how to make, evaluate, and retrieve useful digital information. While the socio-emotional dimension is related to how to use digital technology in a responsible way to socialize, learn, and collaborate.

In contrast to Rahmah (2015), Zhang & Zhu (2016) revealed that there are four dimensions in digital literacy, namely technical skills, critical understanding, creation and communication, and citizenship participation. The dimensions of technical capabilities are related to the ability to use digital media and technology. Technical capability is considered a prerequisite for the other three dimensions. The dimensions of critical understanding are related to the use of critical approaches to analyze and assess the quality and accuracy of content in

digital media (Koltay, 2011; Zhang & Zhu, 2016). The dimensions of creation and communication are related to the ability to produce writing with digital media and the ability to interact with others through digital media (Buckingham, 2009; Zhang & Zhu, 2016). The dimensions of citizenship participation are related to the ability to participate socially and access opinions in digital media responsibly (Park, 2012; Zhang & Zhu, 2016).

Based on the development of dimensions from various digital literacy literature, it can be concluded that digital literacy is a concept that is not simply because it involves several aspects of a person's abilities in it. Greene et al. (2014) added that digital literacy is considered a cognitive process. Therefore, digital literacy is not just how digital media affect a person's cognitive processes, but how a person's cognitive processes through digital media can influence the learning process.

Self-Regulated Learning (SRL)

Self-Regulated Learning (SRL) can be interpreted as a person's ability to manage the learning process (Zimmerman & Schunk, 2011 in Cho et al., 2017). SRL can also be interpreted as someone's process to direct themselves to be able to learn more effectively (Toering, Elferink-Gemser, Jonker, van Heuvelen, & Visscher, 2012). In SRL, the process of directing oneself includes how one can control their thoughts, feelings, and actions (Baumeister & Vohs, 2004 in Toering et al., 2012) to be able to transform their mental abilities into abilities related to performance (Zimmerman, 2008; Toering et al., 2012).

In Toering et al. (2012), Willem, Aiello, & Bartolome (2006), and Cho et al. (2017) stated that there are several SRL dimensions, namely planning, self-monitoring, evaluation, reflection, effort, and self-efficacy. The planning dimension relates to how someone plans before doing or completing a task. The dimensions of self-monitoring are related to how one monitors the process during a task or work takes place. The evaluation dimension relates to how someone evaluates the process and results after a task or work is completed. The reflection dimension is related to the contemplation of the learning process carried out starting from the process of planning, monitoring, and evaluation. In the process of reflection, one can reflect on the application of knowledge to the abilities they have in the process of working on or completing something. The effort dimension is related to one's effort in facing challenging learning situations, while the dimensions of self-efficacy are related to the level of self-confidence and one's belief in their ability to control their learning process.

SRL itself has several levels, meaning that someone has a certain SRL level. This is based on the statement of Zimmerman (2006) in Cho et al. (2017) that SRL is a continuum between people who have low SRL (less skillful self-regulated learners) and people who have high SRL (skillful self-regulated learner). People with high SRL have the capacity to set goals, master what their learning goals are, have high self-confidence in learning, and associate their unsatisfactory work results with mistakes in learning strategies or their failure to manage learning resources effectively (Zimmerman, 2008; Cho et al., 2017). Whereas people with low SRL often fail to set goals, tend to pursue performance (results) and avoid goals, show low self-confidence in learning, and associate their unsatisfactory results with external sources, such as instructors or course designs that do not effective.

Continuum of SRL above shows that having SRL capabilities alone is not enough, because someone must reach a high level of SRL so that the process of managing learning can be fully effective. High SRL becomes an ability that is even more relevant now needed, moreover technological advances and digitalization make all information can be obtained and learned. If you don't have SRL's high ability, then someone can be overwhelmed so that it can adversely affect the quality of the learning process (Greene et al., 2014).

Relationship Between Digital Literacy and Self-Regulated Learning

The term digital literacy has been used since the 1980s, but in a narrower sense, namely how one can use a computer in his work (Mohammadyari & Singh, 2015). The concept is then expanded and described as a set of attitudes, understandings, and skills to deal with and communicate information and knowledge effectively in various media and formats (Mohammadyari & Singh, 2015). Digital literacy refers to a variety of literacies related to the use of digital technology (Mohammadyari & Singh, 2015).

As is known together, ICT (Information and Communication Technology) plays an important role in our society today. The learning process does not escape this transformation (Goulão & Fombona, 2012). The use of technology enables new ways to connect with other people and various information that exists throughout the world. The ease of accessing information leads a person to be able to build a broader knowledge network (Mason & Rennie, 2008 in Goulão & Fombona, 2012). Related to this, digital literacy has become a fundamental skill that must be possessed in the current digitalization era. This can be attributed to the function of digital literacy which is also a major predictor in learning through digital technology (Bawden, 2001; Markless & Streatfield, 2007; Mohammadyari & Singh, 2015).

Related to learning, digital literacy is not just the ability to find and recognize various forms of information but also includes the ability to examine and integrate this information in order to achieve desired learning goals (Greene et al., 2014). Digital literacy leads to the ability to plan, implement, understand, interpret, and evaluate information correctly through the use of digital technology to facilitate the achievement of learning goals (Knutsson et al., 2012; Ng, 2012; Prior et al., 2016). In this case, digital literacy leads to a person's ability to manage and regulate the learning process (SRL). High digital literacy will lead to SRL's high ability too, and vice versa. However, most of the research investigated the relationship of digital literacy with SRL using an experimental approach. The approach focuses only on the use of technology, does not investigate further how the use of these technologies can have an impact on the ability of one's SRL (Perera, n.d.). In addition, the generalization of the findings of studies on digital literacy with SRL in the context of informal learning is also limited, so there is a lack of empirical evidence on this matter (Perera, n.d.). This has helped strengthen the development of hypotheses regarding the relationship between digital literacy and SRL in the context of informal learning.

RESEARCH METHODOLOGY

The population is the number of elements that are expected to make some conclusions (Cooper & Schindler, 2011). The population in this study were college students who were

studying in Yogyakarta. Regarding sampling, this study used a simple random sampling technique. This is based on the population who have the same opportunity to be chosen as sample members (Cooper & Schindler, 2011). The total sample of respondents in this study were 100 students.

In this study, the type of data collected was primary data, namely by using an online questionnaire. The questionnaire contained statements about digital literacy (Zhang & Zhu, 2016) and self-regulated learning (Toering et al., 2012). Each answer point on the questionnaire items determined the score using a Likert scale from 1 to 5, where scale 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. Furthermore, the collected data was analyzed using Structural Equation Modeling (SEM).

RESULT AND DISCUSSION

Descriptive statistics in this study describe a data consisting of mean, standard deviation, and correlation between variables. Table 1 shows the descriptive statistics of this study.

Table 1. Descriptive Statistics

Variable	Mean	Std. Deviation	Digital Literacy	SRL
Digital Literacy	4,51	0,799	1	
SRL	4,18	0,81	0,748*	1

Dependent variable: SRL

N=100; *p < 0,05

In this study, there were two stages in the SEM analysis procedure (Anderson & Gerbing's, 1988 in Fan et al., 2014). The first stage, conducting confirmatory factor analysis (CFA) on the measurement of the model and the second stage, estimated the structural model for testing the hypothesis.

Table 2 shows the results of the validity test using CFA, where the criteria used to determine the validity of a question item, namely the standardization of loading above 0,5 to meet convergent validity. Based on the results shown in table 2, all question items from the digital literacy and SRL variables are declared valid because they have loading values above 0,5. Table 2 also shows the reliability test results of the two variables whose values are above 0,6. This shows that digital literacy and SRL variables meet the criteria for being declared reliable.

Table 2. The Results of Validity and Reliability Tests

Variables	Factor Loadings	Cronbach's Alpha
LD1	0,896	0,940
LD2	0,793	
LD3	0,767	
LD4	0,851	
LD5	0,790	
LD6	0,818	
LD16	0,834	

LD17	0,734	
LD18	0,860	
LD19	0,704	
SRL1	0,769	0,975
SRL2	0,814	
SRL3	0,673	
SRL6	0,783	
SRL7	0,725	
SRL9	0,780	
SRL10	0,750	
SRL11	0,710	
SRL14	0,694	
SRL15	0,741	
SRL16	0,727	
SRL17	0,693	
SRL18	0,838	
SRL19	0,856	
SRL20	0,781	
SRL21	0,831	
SRL22	0,836	
SRL23	0,761	
SRL29	0,792	
SRL30	0,804	
SRL31	0,692	
SRL32	0,825	
SRL33	0,713	
SRL36	0,782	
SRL37	0,711	
SRL38	0,731	
SRL39	0,759	
SRL40	0,850	
SRL48	0,736	

After the CFA stage is done, the next step is to estimate the structural model for testing the hypothesis. In measuring SEM analysis, there are several good model fit indicators that are produced, among others, chi-square (χ^2) with a degree of freedom (degree of freedom) < 2 or > 1 , this is considered an indication of good model fit and mean-square residual standard error $\leq 0,08$ also indicates that the model is good (good model fit). Based on the results of data processing, the model in this study can be said to be good (good model fit), because it has a chi-square value of 1,329 (< 2 dan > 1) or SRMR value of 0,073 ($\leq 0,08$).

Table 3. The Results of Hypothesis Testing

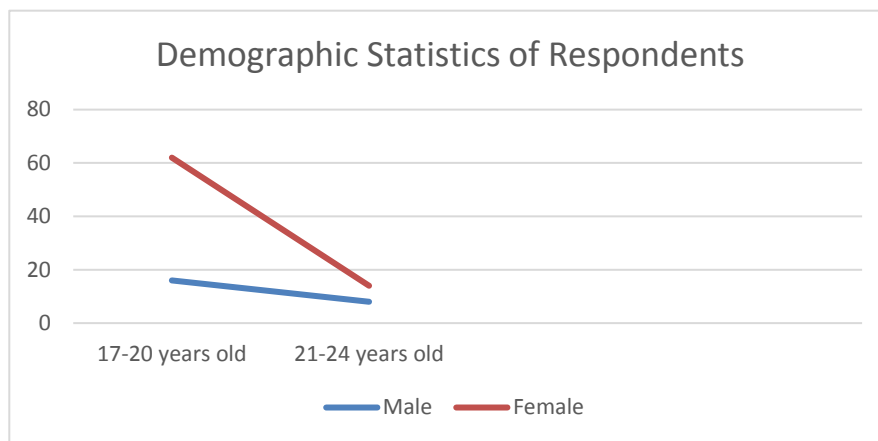
Hypothesis	Path Coefficient	Adjusted R ²	p-Value	Conclusion
DL → SRL	0,748	0,556	0,000	Supported

DL: Digital Literacy; SRL: Self-Regulated Learning

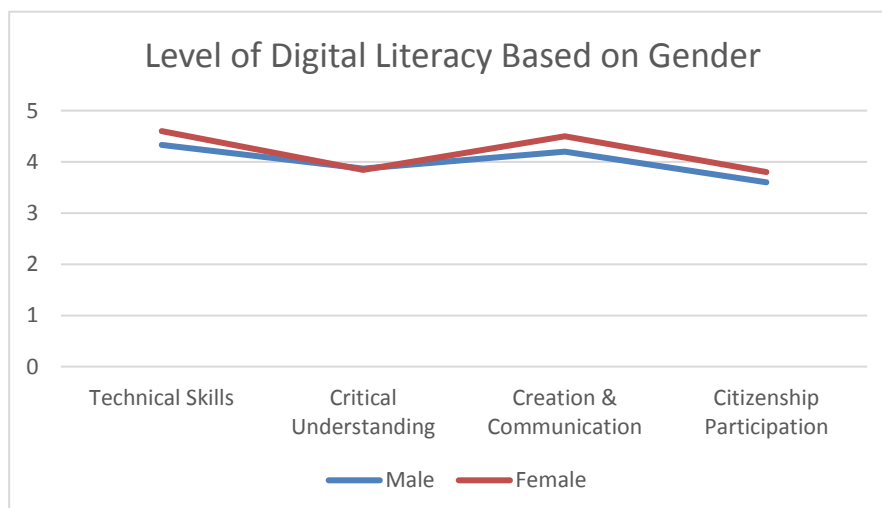
*p < 0,05

Hypothesis testing is done to see the effect of digital literacy on SRL. Table 3 shows that digital literacy has a significant positive effect on SRL ($p < 0,05$). This shows that the hypothesis is supported. These results are in accordance with previous studies conducted by (Perera, n.d.) and Mohammadyari & Singh (2015). In table 3, the adjusted R² value is 0,556. This shows that the digital literacy variable explains SRL variable variance by 55,6%, while the remaining 44,4% is explained by other variables outside the model.

Figure 1.



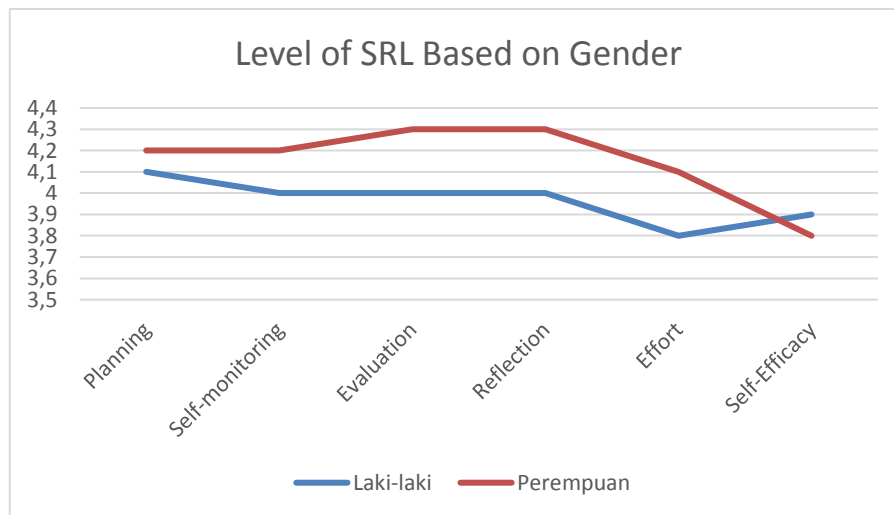
Demographic Statistics of Respondents



This research was conducted on 100 college students consisting of 24 men and 76 women (figure 1). In previous studies, activities related to digital media were often tested by linking gender issues, but findings were not always consistent (Zhang & Zhu, 2016). In Figure 2, a comparison of the level of digital literacy between men and women is shown. Overall, the

digital literacy level of female students is higher than that of male students. This can be seen from the 4 dimensions of digital literacy that exist, female students have higher scores in 3 dimensions, namely the dimensions of technical skills, creation and communication, and citizenship participation. This means that female students have the ability to use digital media and technology better than male students. Female students are also more capable and wiser in using digital media to interact. These findings are consistent with the research of Ritzhaupt, Dawson, & Barron (2013), Nijlen et al. (2015) and Zhang & Zhu (2016) which state that women are better at applying digital media. But this finding contradicts with the research of Markauskaite (2005) and Meelissen (2008) which states that activities related to digital media are men area, where men are considered more confident and more often use digital media (Li & Kirkup, 2007; Zhang & Zhu, 2016).

Another interesting thing that can be observed from Figure 2 is that both male and female students have scores that are not so high in the critical understanding dimension. Technically speaking, male and female students can be said to be high (mean = 4,5), but in terms of the ability to analyze, assess the quality and accuracy of content, and filter information only insufficient categories (mean = 3,8). In fact, the ability to be more critical of information from digital media is important, considering the easier information is obtained. Especially as digital natives, who live and are formed in an environment that is so familiar with technology, these students must become independent learners to be able to adapt to the challenges of the digital age. Able to use digital media wisely and can understand what, why, and how to use it properly (Rahmah, 2015).



SRL is an important factor that can explain one's learning experience (Bol & Garner, 2011; Broadbent & Poon, 2015; Cho & Heron, 2015; Cho, Kim, & Choi, 2017). SRL is also considered as a set of abilities for someone to control factors that can have an impact on a person's learning process, such as cognitive, motivational, emotional, and social (B. Zimmerman, 1990). Based on Figure 3, female students have higher scores than male students in the 5 dimensions of SRL, namely the planning, self-monitoring, evaluation, reflection, and effort dimensions. That is, overall female students can be said to be better able to manage themselves, both cognitively, motivationally, emotionally and socially so that they can be more

effective in learning. However, it turns out that female student self-efficacy is lower than male students (figure 3). Even though self-efficacy has an important effect on the success of one's learning, especially in a learning environment that is now completely online (Prior et al., 2016). This becomes interesting because the hope is that the ease of access to information currently available has a positive correlation with one's learning process. But the test results prove that female students with good self-management (cognitive, motivational, and emotional) do not necessarily have high self-efficacy in the learning process. In contrast to male students, although self-management in the learning process can be said to be only insufficient categories, it can still have better self-efficacy than female students.

CONCLUSION

The digital age today makes the spread of technology and information so fast and easy that it has a profound impact on the lives of many people (Soysal, Çallı, & Coşkun, 2019). Digital natives are also no exception, most of them have been introduced to technology since childhood, which has an impact on their ability to use technology. But being technically capable is not enough in the current era, they must be able to develop the ability to be able to obtain information effectively and use it wisely (digital literacy) (Soysal et al., 2019).

This study examines the level of digital literacy of college students at several universities in Yogyakarta and how they affect their ability to manage their learning process (SRL). Based on gender it was found that the digital literacy rate of female students was higher than that of male students. This is in line with research Ritzhaupt et al. (2013) and Nijlen et al. (2015). However, several studies have found the opposite results, namely the research of Markauskaite (2005) and Meelissen (2008). Because there are inconsistencies in the findings, there is still a need for further research to find out the factors that can cause differences in the level of digital literacy between men and women. Future research can reexamine the relationship between digital literacy and gender, then age, social and economic status, and education level to find out how much demographic factors affect one's digital literacy level (Skills, 2011 and Ritzhaupt et al., 2013).

This study also found that digital literacy has a positive effect on a person's capacity to manage the learning process (SRL). These results are in line with the research of Perera (n.d.) and Mohammadyari & Singh (2015). But there are interesting things found, according to Edvard, Throndsen, Loi, & Gudmundsdottir (2018), one of the factors that can actually explain a person's level of digital literacy is autonomous learning. The simple definition of autonomous learning is the same as the definition of SRL, which is a person's capacity to control his learning process (Selcuk, 2019). That is, SRL can be a determinant of one's digital literacy level. Future research can find out the relationship between SRL (as an independent variable) and digital literacy (as a dependent variable) and testing how it affects.

REFERENCES

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

- Bol, L., & Garner, J. K. (2011). Challenges in supporting self-regulation in distance education environments. *Journal of Computing in Higher Education*, 23(2–3), 104–123. <https://doi.org/10.1007/s12528-011-9046-7>
- Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *Internet and Higher Education*, 27, 1–13. <https://doi.org/10.1016/j.iheduc.2015.04.007>
- Buckingham, D. (2009). Digital Media Literacies : rethinking. *Research in Comparative and International Education*, 2(1), 43–55. <https://doi.org/10.2304/rcie.2007.2.1.43>
- Cho, M. H., & Heron, M. L. (2015). Self-regulated learning: the role of motivation, emotion, and use of learning strategies in students' learning experiences in a self-paced online mathematics course. *Distance Education*, 36(1), 80–99. <https://doi.org/10.1080/01587919.2015.1019963>
- Cho, M. H., Kim, Y., & Choi, D. H. (2017). The effect of self-regulated learning on college students' perceptions of community of inquiry and affective outcomes in online learning. *Internet and Higher Education*, 34(February), 10–17. <https://doi.org/10.1016/j.iheduc.2017.04.001>
- Edvard, O., Throndsen, I., Loi, M., & Gudmundsdottir, G. B. (2018). Computers & Education Students' ICT self-efficacy and computer and information literacy : Determinants and relationships, 118(November 2017), 107–119. <https://doi.org/10.1016/j.compedu.2017.11.011>
- Goulão, M. de F., & Fombona, J. (2012). Digital Literacy and Adults Learners' Perception: The Case of a Second Chance to University. *Procedia - Social and Behavioral Sciences*, 46, 350–355. <https://doi.org/10.1016/j.sbspro.2012.05.121>
- Greene, J. A., Yu, S. B., & Copeland, D. Z. (2014). Measuring critical components of digital literacy and their relationships with learning. *Computers and Education*, 76, 55–69. <https://doi.org/10.1016/j.compedu.2014.03.008>
- Knutsson, O., Blåsjö, M., Hållsten, S., & Karlström, P. (2012). Identifying different registers of digital literacy in virtual learning environments. *Internet and Higher Education*, 15(4), 237–246. <https://doi.org/10.1016/j.iheduc.2011.11.002>
- Koltay, T. (2011). The media and the literacies: Media literacy, information literacy, digital literacy. *Media, Culture and Society*, 33(2), 211–221. <https://doi.org/10.1177/0163443710393382>
- Li, N., & Kirkup, G. (2007). Gender and cultural differences in Internet use : A study of China and the UK, 48, 301–317. <https://doi.org/10.1016/j.compedu.2005.01.007>
- Markauskaite, L. (2005). Exploring differences in trainee teachers' ICT literacy : Does gender matter ?, 445–455.
- Markless, S., & Streatfield, D. (2007). Three decades of information literacy : redefining the parameters. *Change and Challenge: Information Literacy for the 21st Century*, 17. Retrieved from <http://informat.org/pdfs/Streatfield-Markless.pdf>
- Meelissen, M. R. M. (2008). Gender differences in computer attitudes : Does the school matter ?, 24, 969–985. <https://doi.org/10.1016/j.chb.2007.03.001>
- Mohammadyari, S., & Singh, H. (2015). Understanding the effect of e-learning on individual

- performance: The role of digital literacy. *Computers and Education*, 82, 11–25.
<https://doi.org/10.1016/j.compedu.2014.10.025>
- Ng, W. (2012). Can we teach digital natives digital literacy? *Computers and Education*, 59(3), 1065–1078. <https://doi.org/10.1016/j.compedu.2012.04.016>
- Nijlen, V., Vanderlinde, R., Tondeur, J., Devlieger, I., Aesaert, K., & Braak, J. Van. (2015). *Computers & Education* The contribution of pupil , classroom and school level characteristics to primary school pupils ' ICT competences : A performance-based approach, 87. <https://doi.org/10.1016/j.compedu.2015.03.014>
- Park, S. (2012). *Sora Park*, (142), 87–100.
- Perera, M. U. (n.d.). Analyzing the Relationships between Digital Literacy and Self-Regulated Learning of Undergraduates – A Preliminary Investigation LEARNING via Personal Learning Environments what they need , rarely. Retrieved from <https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1169&context=isd2014>
- Prior, D. D., Mazanov, J., Meacham, D., Heaslip, G., & Hanson, J. (2016). Attitude, digital literacy and self efficacy: Flow-on effects for online learning behavior. *Internet and Higher Education*, 29, 91–97. <https://doi.org/10.1016/j.iheduc.2016.01.001>
- Rahmah, A. (2015). Digital Literacy Learning System for Indonesian Citizen. *Procedia Computer Science*, 72, 94–101. <https://doi.org/10.1016/j.procs.2015.12.109>
- Ritzhaupt, A. D., Dawson, K., & Barron, A. E. (2013). *Albert D . Ritzhaupt*, 45(4), 291–307.
- Selcuk, H. (2019). Digital Literacy, Creativity, and Autonomous Learning, (April), 0–8.
<https://doi.org/10.1007/978-3-319-60013-0>
- Skills, I. (2011). *Media & Society Internet Skills and the Digital Divide*, (December 2010).
<https://doi.org/10.1177/1461444810386774>
- Soysal, F., Çallı, B. A., & Coşkun, E. (2019). Intra and Intergenerational Digital Divide through ICT Literacy , Information Acquisition Skills , and Internet Utilization Purposes : An Analysis of Gen Z, 8(1), 264–274. <https://doi.org/10.18421/TEM81-37>
- Toering, T., Elferink-Gemser, M. T., Jonker, L., van Heuvelen, M. J. G., & Visscher, C. (2012). Measuring self-regulation in a learning context: Reliability and validity of the Self-Regulation of Learning Self-Report Scale (SRL-SRS). *International Journal of Sport and Exercise Psychology*, 10(1), 24–38.
<https://doi.org/10.1080/1612197X.2012.645132>
- Willem, C., Aiello, M., & Bartolome, A. (2006). Blended Learning and New Literacies: An Experience at the University of Barcelona (Spain), 2003-2005. *International Journal of Technology, Knowledge and Society*, 2(8), 107–114. Retrieved from <http://ezproxy.lib.gla.ac.uk/login?url=http://search.proquest.com/docview/868017132?accountid=14540%0Ahttp://eleanor.lib.gla.ac.uk:4550/resserv?genre=article&issn=18323669&title=International+Journal+of+Technology%2C+Knowledge+and+Society&volume=2&issue=8>
- Zhang, H., & Zhu, C. (2016). A Study of Digital Media Literacy of the 5th and 6th Grade Primary Students in Beijing. *Asia-Pacific Education Researcher*, 25(4), 579–592.
<https://doi.org/10.1007/s40299-016-0285-2>
- Zimmerman, B. (1990). Zimmerman (1).Pdf. *Educational Psychologist*.

Zimmerman, B. J. (2008). Investigating Self-Regulation and Motivation: Historical Background, Methodological Developments, and Future Prospects. *American Educational Research Journal*, 45(1), 166–183.
<https://doi.org/10.3102/0002831207312909>

Zimmerman, B. J. (2018). C H A P T E R 39 Development and Adaptation of Expertise : The Role of Self-Regulatory Processes and Beliefs.