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Digital Literacy in Formal Online Education: A Short Review

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Abstract

This study aims to explain the current findings of digital literacy in formal online education. The methods of research is a type of library description obtained from relevant scientific articles obtained from internet search media library engines: proquest, researchgate, google scholar and other search engines with keyword search "digital literacy" to find the publication of related scientific papers/ relevant to the topic. Then the 41 articles found (listed in the references) are studied and then explained from the author's perspective. Digital literacy is multi-dimensional, built by multi construct hypotesis. In the previous research found a higher level of digital literacy that was positively related to the output of learning outcomes in the subjects studied. Online learners feel anxious because they do not understand and are accustomed to online classes, especially for those who have limited computer skills. Most importantly, independent students get the final grade of the program far better than non-independent students. The best predictor of academic success, measured by the final grades, namely components of academic skills, reading and writing abilities. Higher levels of digital literacy positively affected the high output of learning outcomes to student academic performance..

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INTRODUCTION

Now in the digital era surrounded by major disruptive changes in many aspects of life, change affects the learning process as in how to relate to each other and in how to learn, scientists and practitioners must understand how to manage this dynamic change (Bates, 2015; Nambisan et al., 2017), as well as changes in the setting of learning places from dealing face to face in conventional classes to virtual meetings in online learning classes. The online learning model continues to increase in popularity in tertiary education, as many tertiary institutions try to facilitate modern and flexible educational opportunities for students, as well as create interactive digital learning experiences found in attractive and effective virtual classes in undergraduate and postgraduate education (postgraduate) (Mery & Newby, 2014).

It is a great challenge to provide an interactive learning experience for students in large numbers and to remember that efforts related to improving the quality of pedagogy at tertiary institutions have become the main catalyst for reconsidering targeted teaching approaches in higher education (Hornsby & Osman, 2014). A great desire to utilize technology to provide easier, large and diverse access to learning resources in overcoming the problem of distance between students and tutors and to facilitate increased interaction and collaboration in online classes (Siemens, Gaševic, & Dawson, 2015), becomes the basic reason for the need for education in virtual classrooms and research regarding the variables in it is done.

While digital literacy is a person's ability to read and interpret data in the digital world, in a study conducted by Kerr, Rynearson and Kerr in (2006) found that higher levels of skill in operating computer software and hardware positively affected the high output of learning outcomes to students. Budiwati (2007) from the Open University shows variables that affect student learning experiences (including digital literacy components) such as internet access (condition of access) in online tutorials as well as the ability and activeness of student responses to tutors in discussions, both the poor management and the quality of online tutorial class management is a factor in why students cannot perform well (poor student academic achievement) in online tutorial classes. It is clear that competence to utilize the digital world (digital competence) is influenced by digital literacy (Spante, 2018).

In contrast with America and Europe, the Asian continent has a fairly low percentage of 8% in the amount of scientific research on digital literacy (Mathar, 2014: 7). In Indonesia, not many studies have examined this digital literacy. Previous research studies more about information literacy, social media literacy and ICT literacy in a particular community group in several regions in Indonesia. One sub-variable of digital literacy is the condition of internet access and the use of social media (Lopez Islas, 2013).

From the previous reseach which shows the influential factors in student learning achievement in virtual classrooms and digital literacy level research that is rarely done in Indonesian tertiary institutions, in this dissertation research the writer will try to explain empirical facts whether there is an influence of digital literacy on academic performance in this review paper.

METHODS

This research uses descriptive qualitative approach. Desriptive research attempts to explore the complexities that exist so that understanding can be generated (George, & Selimos, 2018). Interesting to know about formal digital literacy in open education issues. Given that further publication related to this topic is still rare. The writing of this paper is a type of library description article obtained from relevant scientific articles obtained from internet search media library engines: proquest, researchgate, google scholar and other search engines with keyword search "digital literacy" to find the publication of related scientific

papers/ relevant to the topic. Then 41 articles found (listed in references) are studied including two paper from dinamika pendidikan's journal (Kardiyem et al., 2019, Sriyono et al., 2019) and then the material is presented and explained in the author's perspective and words.

RESULT AND DISCUSSION

Digital Literacy's History

Paul Gilster first put forward the term digital literacy in his book (Gilster, 1997). He argued that digital literacy is the ability to use software and hardware technology and interpret information from digital devices effectively and efficiently in various contexts such as in the need to support academic achievement, career and daily life (Riel, et. Al. 2012: 3). Gilster's opinion simplifies digital media which actually consists of various forms of complex information at once such as sound, text, images and video. Therefore Eshet (2002) emphasizes that digital literacy should be more than the ability to utilize various digital sources effectively, but rather a broader concept.

Digital literacy is also described as a form of certain ways of thinking (multi construct hypothesis) in utilizing the digital world. Bawden (2001) describes digital literacy that is rooted in history rather than computer literacy and information literacy. Computer literacy developed in the 1980s when the first generation of computers became increasingly widely used not only in the business environment but also in the community. Whereas the term information literacy became widespread in the 1990s as information became more easily compiled, accessed, disseminated through information technology.

Riel et al. (2012) concur with previous experts who stated that digital literacy is multi-dimensional. However, different from the opinion expressed by Martin (2008), he explained that digital literacy is horizontal rather than vertical classification. Digital literacy is expressed in several capability groups as described in Figure 1.

Figure 1. Digital Literacy Concept (JISC Digital Capacity Framework, 2015)

Interaction in digital media not only requires technical ability to access technology but also understanding the content, active and interactive functions of producing messages. More than that interactions in digital media have consequences for personal safety, privacy, excessive consumption, addressing differences. The concept and dimensions of digital literacy proposed by Riel et al., (2012) are technologically, psychologically and socially charged. So that it can be understood that digital literacy is a form of complex skills and involves new skills that humans must possess in dealing with the current digital environment.

Students today have access to the Internet, either low or high speed, from home or from internet cafes, to maximize the utilization of information technology they need software skills to find information sources, handle their relevance and validity, process them efficiently, and help in helping answer problems to overcome problems related to their academic improvement program. This skill, which Gui (2007) calls substantial information skills,

is considered to be positively related to academic performance.

The skills required use three instruments. First, the Spanish version and adaptation of the TOOLS (Test of Online Learning Success) (Kerr, Rynearson, & Kerr, 2006) are used as proxies to improve students' information skills. In this test - which measures the characteristics of students who predict success in the context of online learning - students assess themselves in four dimensions that have been approved as predictors of success in online learning: academic training, computer skills, independent learning, and motivation; and the need for online learning (for geographical, family, personal or work reasons). Student responses are used to calculate scores known as Online Learning Successes.

The second measure of digital skills is the translation of the Hargittai instrument (2005) in Spanish to collect a measure of web-oriented digital literacy surveys. Although this instrument is not a direct measurement of digital skills, it has been validated as a proxy for actual digital literacy. The steps of this survey complement the data collected with instruments based on the subject's self-reporting. The measurement of three digital skills is an adaptation of a 16-item online test developed by librarian Tecnológico de Monterrey to assess student competencies with the American Library Association (1998) information literacy standards for student learning. This instrument - developed in Spanish - developed students' skills to find information effectively and efficiently, evaluate the results critically, and use them responsibly.

Internet self-efficacy is a belief in one's ability to regulate and carry out the actions of the Internet that is needed to produce a given achievement (Eastin and LaRose, 2000, p. 2) - is a state of attitude that can be positively related to academic success. Although self-efficacy of the Internet is not always a measure of actual ability to use the Internet, it may contribute to reducing anxiety when students are newbies in using the Internet and to continue learning to exploit the new features offered by technology. Translations from Spanish and an eight-item scale adaptation of Eastin and LaRose (2000) were used to measure students' self-efficacy of the Internet.

Social Media is One Supporting Component of Digital Literacy

Seeing the phenomenon of digital social networks in the past decade, most of them refer to internet-based services such as Facebook, Instagram and Twitter which are platforms that are often used by the community, this might be interesting when studying the subvariable relationships related to social media that are included in the concept extensive digital literacy and its relationship to academic performance online learning. Beyond the main purpose of presenting entertainment for the public from this social media platform, it turns out that active social media can influence learning in new ways that were not previously thought of.

For example, Ellison, Steinfield and Lampe (2007) approached the phenomenon from the perspective of social capital, finding that the use of Facebook is positively related to bridging, binding and maintaining social contact, with social media there is emotional support that can affect student academics. This includes psychological support ties from relationships such as family and good friends. By maintaining social capital one can stay connected to social networks even after moving to a different place. In the context of online learning, users of social networks can have more emotional support than non-users, especially if they have low self-confidence (private closed).

Conditions of Access Influence Digital Literacy

Having access to the internet is a necessary condition for participating in online learning programs. However, access to communication and information technology is not a simple yes or no situation, but rather a matter of degree. Aspects such as access to the Internet from home rather than from a community

center or cybercafe; own computer usage; or the availability of broadband connections represent various levels of connectivity that can be linked to academic success, because they provide various levels of flexibility in terms of time and availability of computing and information resources.

It can be expected that the better the conditions of access to students' communication and information technology, the better their academic performance. For example, access to the Internet from home versus access from internet cafes, workplaces, or school facilities is very important for understanding the conditions under which students must carry out their online learning activities. Students who have to commute to the internet cafe to get access to the Internet on a limited basis are at a disadvantage compared to students who have permanent Internet access from home.

Likewise, ownership or permanent access to computer equipment compared to students who have to go to an internet cafe/ borrow a friend's laptop may be related to academic performance, because students who have their own computer equipment may have more opportunities to spend time exploring various computer features and storing and storing take greater amounts of academic and personal information (e-mail, music, pictures, videos, etc.) than those who do not have their own PC / laptop.

The following conditions for access variables are measured: Time of using the Internet (in years); frequency of connection to the Internet; availability of Internet access from home; access to computers at home; the number of computers at home; access to cable television at home; ownership of a fixed telephone line at home; cellphone ownership; and the number of televisions in the home (Lopez Islas, 2013).

Measuring Digital Literacy Level as A Predictor of Student Success

In the same thinking but from a broader perspective, the concept of digital literacy represents an integrated approach that functions as a framework for a number of complex and integrated sub-disciplines consisting of skills, knowledge, ethics and creative output in a digital network environment (Covello, 2010). Deursen and van Dijk (2011) created a test to measure digital literacy from a population sample in the Netherlands by evaluating how well the subjects performed in nine assignments to find information about government. The successful completion of the task and the time required is used as a criterion for assessing digital literacy.

The study found that years of internet experience and the number of hours spent online per week only correlated weakly with the level of digital skills. The authors conclude that operational and formal Internet skills are a necessary but not sufficient condition for the performance of information skills and strategic skills in a digital environment (p. 19). In addition, they suggest that when the Internet will be used for certain substantial purposes (information, external objectives) specific information and strategic skills training should be added (specific to content access). Systematic training of information skills on the Internet is an urgent task for all levels of education, from elementary school to tertiary education.

Measuring the actual skill level for digital literacy assessment is a difficult task. Therefore, most research on digital literacy depends on measures of digital capabilities that are felt by themselves. Based on research comparing direct measurements of what subjects are able to do with the web, the way they describe what they are able to do, Hargittai (2005) developed a web-oriented digital literacy survey measure that functions as a valid skill measure. These steps are confirmed and updated by more recent studies (Hargittai, 2009).

Based on their own definition, Calvani, Cartelli, Fini and Ranieri (2008) created the Digital Competency Assessment instrument, an online 85-item test that measures how competently digital middle school students are. Using a translated version of this instrument, Li and Ranieri (2010) measured digital literacy from a sample of ninth grade students

in China from different schools, adolescents whose age could be considered digital natives (millennial generation / digital native). The researchers found that in this digital native group, overall performance was judged to be nearly as poor as it should have been as expected of children who had internet access available throughout their lives.

In addition, this study found real differences between students in digital literacy, and the differences were not related to whether students had computers, or had access to the Internet from home, or the frequency of using the Internet, but the schools that they visit. Other studies that measure digital literacy of the younger generation (millennial), Cabra-Torres and Marciales-Vivas (2009) conclude that although millennials seem to be very capable of using technology, they no longer need basic skills training to evaluate and use information in online classes appropriately.

Likewise, Hargittai (2010) measures the Internet skills of first-year students, finding students with higher levels of Internet skills are involved in various types of web use. The author concludes that what is usually considered about digital knowledge inherent from relatively young users often referred to as digital native does not support the premise that young adults have universal and in-depth knowledge of the Web. In contrast, "we observe systematic variations in online knowledge even among a group of young adults who are strongly connected based on user background".

Assessment tools to measure academic achievement are important components of online tutorials that provide updates and feedback to students, enabling them to monitor their progress. When teachers post assignments or online activities, assessment can be done directly in the online tutorial software. The teacher / tutor can view tasks and activities that are completed, add comments, provide feedback and provide grades, and allocate points for each discussion and assignment that has been completed (Moodle™, 2013). To help the assessment process, rubrics are widely used. The rubric (online tutorial) is an assessment tool used by faculty to describe the expectations of an assignment (Stevens & Levi, 2005).

Stevens and Levi (2005) define the rubric as "a measurement tool for detailed descriptions of what constitutes an acceptable or unacceptable level of learning performance for each section contained (such as discussion forums, quizzes, etc.)". Grades and comments are automatically imported by the software into the report results where students can monitor the progress of their grades live and manage their academic performance. The software can store, calculate, and distribute information content and grades in class activities to each student (Sakai™, 2013). In Blackboard™ (2013), instructors have the capacity to set color codes, visual indicator criteria, to recognize trends of students who are at risk of failing, allowing early intervention (fostering students who score less).

Other online tutorial software features that track student progress include online tests, quizzes, surveys and polls. Settings for online tests, quizzes, surveys and polls can be set for automatic assessment. The instructor makes the test by adding questions to the question bank. With their authority, instructors can produce questions in various formats: true-false, multiple-choice, multiple answers, matching, short answers, and essays (Simonson, 2007). Questions can be reused in the same course or transferred throughout the course of the same instructor. Special settings provide a timer to ensure automatic delivery, even if students have not finished (Blackboard ™, 2013).

Students get a confirmation notice to let them know that the instructor will accept the submission. Statistical analysis and reports can be generated by software to summarize student performance. Student activity reports are available for administrators, instructors, and students. Administrators have access to every subject in the system and for all users, instructors are limited to the course and each student, and students are limited to their individual reports (Blackboard™, 2013). Activity reports usually include user names, dates, and

time stamps, and may be more robust or efficient, depending on how the administrator sets filtering options.

Reports can track items, such as logins, assignments, average grade assignments, activity logs, frequency of forum posts, and items students have not yet completed. Student activity reports provide more insight into how students interact with courses, instructors, and other students (Simonson, 2007). Other reports generated from many online tutorial software include learning standards and learning objectives, and whether the course is adapted to these benchmarks (Blackboard ™, 2013). For example, content pages, assignments, and assessments must be adjusted to stated standards and objectives. Reports on student performance and scope of objectives are very important to review the overall program and student performance and provide greater visibility for learning outcomes. Blackboard ™ (2013) produces three types of reports: course performance, student performance, and target performance.

Digital Literacy and Academic Performance in Online Learning

Students as educated people carry the mandate as the future generation of the nation. Students have responsibility to continue and replace the previous generation to make improvement to the nation to be more advanced. The responsibility will be able to be carried out by students when they always practice critical thinking on campus, including their ability in digital literacy. Their ability to think critically will be needed when students are in society to solve existing problems. Students are expected to be able to implemented the theories they gain on campus against real problems that happened in the community (Kardiyem et al., 2019).

One of the goals of learning is to achieve achievements that are indicators of successful learning in tertiary institutions. Students with high academic performance are considered to have high intellectual abilities and have a chance of success in society, both in learning outcomes and later professional work (Pambayun, 2010). Academic performance is needed by students because it is considered to be able to describe the ability of students from the results of learning behavior in the form of positive changes in students including skills, skills and new knowledge (Haque, 2015).

Measurement of learning outcomes in a certain period of time resulting from the implementation of tests and non-tests on students will produce a number that is used as a benchmark for the academic performance of students in a subject. This methods of assessment can be used as a benchmark for the academic success of students in any subject including economic education. The results showed of the estimated measure of success can be referred to as learning success (Sriyono et al., 2019).

Academic performance is a written assessment in the form of numbers or values from the results of evaluations and measurements of performance of learning outcomes (Salvin, 2010). Measurement of academic achievement can be obtained through scores or test scores of subjects that have been standardized by educational institutions (Fineburg, 2009). Khairat & Adiyanti in 2015 revealed that the measurement of academic performance and student activities in educational institutions was considered sufficient to be seen from the value of students for one year or in the middle of the year. There are several factors that can affect the achievement of academic performance, including internal factors, namely physical factors (health, disability), psychological (intelligence, attitudes, talents, interests and motivation), and external factors, namely factors of family support, management of educational institutions, society and mass media, and finally the learning approach factor (approach learning) (Syah, 2008).

Kerr, Rynerson and Kerr (2006) built and tested instruments to predict the success of online students measured by the final grade by identifying the strengths and weaknesses of students (strenghtness and weakness) in following online learning. The 45-item test made

known by the name TOOLS (Test of Online Learning System) is available open source to the public who will register in an online classroom program. Calculating the results is a simple task and subjects may immediately know the results in minutes how precisely online learning can be done for them, based on four dimensions: reading and writing skills, independent learning, motivation, and computer literacy.

In research conducted with TOOLS, Kerr, Rynerson and Kerr (2006) found a higher level of computer skills that was positively related to the output of learning outcomes in the subjects studied. It is common that online learners first feel anxious because they do not understand and are accustomed to online classes, especially for those who have limited computer skills. That is why the need for basic training in the use of computers to increase their level of confidence. Likewise, being able to be an independent learner who is able to manage time, manage multiple tasks, set goals, and act disciplined can increase confidence and self-efficacy towards the success of online learning.

Most importantly, independent students get the final grade of the program far better than non-independent students. The best predictor of academic success, measured by the final grades, namely components of academic skills, reading and writing abilities. DeTure (2004) studies the independence of students in online learning, and self-efficacy in using technology. Self-independence is a cognitive style based on one's tendency to perform cognitive restructuring tasks. Someone who is able to learn independently is said to be more successful than those who depend on others.

Furthermore DeTure (2004) explains the relationship between students' independence in online learning and self-efficacy in using online technology, and their academic performance, which is measured in mean points. The study found that students who were more independent in the field had higher self-efficacy using online technology. In another study, Li (2008) concluded that computer skills were positively related to online learning attitudes, although this study did not measure students' academic performance.

CONCLUSION

Digital literacy is multi-dimensional, bulit by multi construct hypotesis. In the previous research found a higher level of digital literacy in formal open education that was positively related to the output of learning outcomes in the subjects studied. It is common that online learners first feel anxious because they do not understand and are accustomed to online classes, especially for those who have limited computer skills. That is why the need for basic training in the use of computers to increase their level of confidence.

Students today have access to the Internet, either low or high speed, from home or from internet cafes, to maximize the utilization of information technology they need software skills to find information sources, handle their relevance and validity, process them efficiently, and help in helping answer problems to overcome problems related to their academic improvement program. This skill, calls substantial information skills, is considered to be positively related to academic performance.

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REFERENCES

American Library Association and the Association for Educational Communications and Technology (1998). Information literacy standards for student learning: Standards and indicators. Available at http://www.ala.org/ala//mgrps/divs/aasl/aaslarchive/pubsarchive/informationpower/InformationLiteracyStandards_final.pdf.

Bates, A.W. (2015). *Teaching in a Digital Age*, Ebook, Tony Bates Associates Ltd. ISBN 978-0-9952692-0-0.

Bawden, D. (2001). Information and digital literacies: a review of concepts. *Journal of documentation*, 57(2), 218-259.

Blackboard™. (2013). *Blackboard learn.* Retrieved from http://www.blackboard.com/Platforms/Learn/Overview.aspx.

Budiwati, Y. (2007). *Universitas terbuka*. Retrieved Februari 4, 2016, from Universitas terbuka: www.ut.ac.id.

Cabra-Torres, F., & Marciales-Vivas, G. P. (2009). Mitos, realidades y preguntas de investigación sobre los 'nativos digitales:' Una revisión. *Universitas Psychologica*, 8 (2), May-August 2009.

Calvani, A., Cartelli, A., Fini, A., & Ranieri, M. (2008). Models and instruments for assessing digital competence at school. *Journal of e-Learning and Knowledge Society*, 4 (3), 183-193.

Covello, S. (2010). A review of digital assessment instruments. *Front-End Analysis Research*, Syracuse University, School of Education.

DeTure, M. (2004). Cognitive style and self-efficacy: Predicting student success in online distance education. *The American Journal of Distance Education*, 18 (1), 21-38.

Deursen, Alexander J.A.M. & Van Dijk, Jan A.G.M.. (2011). *Internet skills and the digital divide.* New Media and Society. 13. 893-911. 10.1177/1461444810386774.

Eastin, M. S., & LaRose, R. (2000). Internet self-efficacy and the psychology of the digital divide. *Journal of Computer-Mediated Communication*, 6 (1), September 2000.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, 12, 1143-1168.

Eshet, Y. (2002). *Digital literacy: A new terminology framework and its application to the design of meaningful technology-based learning environments* (pp. 493-498). Association for the Advancement of Computing in Education (AACE).

Fineburg, A. C. (2009). Academic achievement. Dalam Lopez, S. J. (Ed), The encyclopedia of positive psychology: Volume I/A-K (pp. -). West Sussex: Wiley Blacwell

George, G. R., & Selimos, E. D. (2018). Using narrative research to explore the welcoming of newcomer immigrants: A methodological reflection on a community-based research project. *Forum Qualitative Sozialforschung*, 19(2). https://doi.org/10.17169/fqs-19.2.2907

Gilster, P. 1997. *Digital Literacy*. New York: Wiley.

Gui, M. (2007). Formal and substantial Internet information skills: The role of socio-demographic differences on the possession of different components of digital literacy. *First Monday,* 12 (9), 3 September 2007.

Hargittai, E. (2005). Survey measures of web-oriented digital literacy. *Social Science Computer Review*, 23, 371-379.

Hargittai, E. (2009). An update on survey measures of web-oriented digital literacy. *Social Science Computer Review,* 27, 130-137.

Hargittai, E. (2010). Digital na(t)ives? Variation in

Internet skills and uses among members of the "Net Generation." *Sociological Inquiry,* 80, 92-113.

Haque, R. A. (2015). Hubungan konsep diri dengan kepercayaan diri siswa berprestasi kelas VIII SMP Negeri 2 Sukodono. *Skripsi*, UIN Sunan Ampel Surabaya.

Hornsby, D. J., & Osman, R. (2014). Massification in higher education: Large classes and student learning. *Higher Education*, 67(6), 711-719. https://doi.org/10.1007/s10734-014-9733-1.

Jisc (2015) *Developing Digital Literacies [Internet].* Available from: http://www.jisc.ac.uk/guides/developing-digital-literacies.

Kardiyem, K., Widhiastuti, R., Farliana, N., & Mudrikah, S. (2019). Utilization of Information Technology and Lecturer's Role in Accounting Learning on the Conservation Character Values and Academic Performance of "Generation Z" Students. *Dinamika Pendidikan*, 14(2), 178-192. doi:https://doi.org/10.15294/dp.v14i2.21890

Kerr, Marcel & Rynearson, Kimberly & Kerr, Marcus. (2006). Student characteristics for online learning success. *The Internet and Higher Education.* 9. 91-105. 10.1016/j.iheduc.2006.03.002.

Khairat, M., Adiyanti, M.G. (2015). Self-esteem dan prestasi akademik sebagai predictor subjective well-being remaja awal. *Journal of Psychology.* 1, (3). 180-191. ISSN: 2407-7798.

Li, L.Y. (2008). The relationship between computer literacy and online learning attitudes for students in the graduate school of education in Taiwan. (Doctoral dissertation, Alliant International University, 2008). ProQuest Dissertations and Theses.

Li, Y., & Ranieri, M. (2010). Are 'digital natives' really digitally competent?--A study on Chinese teenagers. *British Journal of Educational Technology,* 41 (6), 1029-1042.

Lopez Islas, J.R. (2013). Digital literacy and academic success in online education for underprivileged communities : the prep@net case, Ph.D. *Dissertation*, University of Texas, Austin.

Martin, Allan. (2008). *Digital Literacy and the 'Digital Society' dalam Lankshear, C and Knobel, M (ed).* Digital literacies: concepts, policies and practices. Die Deutsche Bibliothek.

Mathar, T. (2014). Authors Collaboration in Digital Literacy From 1997 to 2013: a bibliometric study. *Khizanah al-Hikmah: Jurnal Ilmu Perpustakaan, Informasi, dan Kearsipan,* 2(2), 149-160.

Mery, Y., & Newby, J. (2014). Online by design. Lanham, MA: Rowman & Littlefield Publishers.

Moodle™. (2013). *Moodle*. Retrieved from http://moodle.com/

Nambisan, S., Lyytinen, K., Song, M. (2017). Digital innovation management: reinventing innovation management in a digital world. *MIS Q.* 41(1), 223–238.

Pambayun, T. (2010). *Kecerdasan vs. kreativitas serta implikasi dalam kegiatan belajar mengajar*. Diunduh dari http://m.kompasiana.com

Riel, J., Christian, S., & Hinson, B. (2012). Charting digital literacy: A framework for information technology and digital skills education in the community college.Presentado en Innovations.

Sakai™. (2013). *Sakai project.* Retrieved from http://www.sakaiproject.org/

Salvin, R. E. (2010). *Educational psychology: Theory and practice. (9th ed.).* New Jersey: Pearson.

Siemens, G., Gaševic, D., & Dawson, S. (2015). Preparing for the digital university: A review of the history and current state of distance, blended, and online learning. Arlington: Link Research Lab. Retrieved from http://linkresearchlab.org/PreparingDigitalUniversity.pdf.

Simonson, M. (2007). Course management systems. *The Quarterly Review of Distance Education,* 8(1), vii-ix. Retrieved from http://web2integration.pbworks.com/f/COURSE+MANAGEMENT+SYSTEMS.pdf.

Stevens, D. D., & Levi, A. (2005). Introduction to rubrics: An assessment tool to save grading time, convey effective feedback, and promote student learning. Sterling, VA: Stylus.

Spante et al., Cogent Education (2018), 5: 1519143

[15]. https://doi.org/10.1080/2331186X.2018.1519143.

Sriyono, H., & Marfu'i, L. (2019). Does Learning Motivation Affect Students' Achievement in Economics? : Identifying The Internal Factor. *Dinamika Pendidikan,* 14(2), 168-177.doi:https://doi.org/10.15294/dp.v14i2.22219

Syah, M., Harsono, H., Prayitno, H., & Fajriyah, D. (2019). Competency Mastery of Information Literacy and Collaboration on Prospective Teacher Students. *Dinamika Pendidikan,* 14(1), 13-25. doi:https://doi.org/10.15294/dp.v14i1.16808