

University Students' Digital Literacy Competence: A Case Study with Learning Management System

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ABSTRACT

In this digital age, processing online information shapes a new form of literacy that emerges Digital Literacy (DL) and capability on this becomes a necessity for citizen in global and digital era therefore this study aims to cultivate digital literacy in Critical Reading Class, a general subject for engineering students through Learning Management System such as Schoology. The Schoology is used as a media to foster this literacy in the class then a questionnaire distributed to depict the impacts of this infusion to the course therefore, this study is conducted under a case study framework. The collected data was analysed using DigCom 2.1 DL framework and the result of this study shows that Schoology builds the participants' DL competences particularly information and data literacy and communication using technologies. This system helps the teacher as well as the students to exploit the DL competences. However, it requires teachers' capability in handling the system. Moreover, this study recommends an intensive teacher training on the mediated ICT instruction and further research on other competence areas as this study merely focuses on certain competence areas.

Keywords: *Critical Reading, DigCom 2.2 Framework, Digital Literacy, Information and data literacy*

1. INTRODUCTION

Becoming skilful in digital literacy (DL) becomes a targeted learning outcome in higher education since it is a prerequisite competence for citizen to study, work, and live in this digital era as technology and internet penetrate daily life activities massively. Education is considered as an effective media to prepare the skilful citizens in DL therefore digital literacy must be embedded in academic practice in the university.

DL is intertwined with ICT and this condition forces educators to integrate ICT assistance in teaching learning activities therefore this study purposes to cultivate digital literacy in Critical Reading class through learning management system such as Schoology as an innovation in teaching and learning practice as Leu (2004) claim that new literacies of the Internet and other ICTs allow us to be actively engaged with them such as identifying important questions, locating information, critically evaluating the usefulness of that information, synthesizing information to answer those questions, and then communicating the answers to

other. These actions are parts of Critical Reading as Kurland (2020) claims critical reading focuses on what a text does and what the text means rather than what a text says that requires capability of analysing, synthesizing, interpreting, and reacting toward the information given in the passage from a reader, therefore it is clearly seen that critical reading can be aimed to foster DL competence. Moreover, Avila & Moore (2012) suggest that critical literacy in this case critical reading can be collaborated with digital literacy and core standard or outcome stated in curriculum practice as the curriculum becomes a guideline for teaching practice to reach the learning goal.

An array of research has been conducted to explore ICT integration in the classroom particularly many developed countries for instance, in UK, USA and Australia. As an example, Bhatt (2012) explored the influence of digital tools in the classroom practice in a UK college and found that success in programs of study often depends on students' capability to negotiate and manage a variety of digital literacy practices commensurate to the literacy demands of their course.

Reichert & Mouza (2018) investigated the benefits and challenges related to the implementation of mobile devices in real classroom contexts in a private school in USA. Moreover, Colwell & Hutchinson (2015) reported that the use of digital technology supports literacy instruction and development in the following ways: (a) Students wrote for more authentic purposes; (b) inclusion of oral language activities using digital recording devices supported students' idea development and writing; (c) students had increased opportunities to interact and collaborate with peers, critically evaluate each other's work, and consider multiple perspectives; (d) students were encouraged to think about traditional content in new ways; and (e) digital tools provided insight into students' reading behaviours and comprehension.

However, a study conducted in 2017 in Indonesia reveals that Indonesia needs more digital literacy educations since the growth of internet users is not parallel with users' ability in analysing information circulation on internet, in another word, the users are still considered as digital illiterate. As consequence, it requires strong effort to integrate digital literacy into curriculum as an attempt to elevate digital literacy among students (Kurnia & Astuti, 2017). Therefore, this study purposes to engage students with digital literacy in Critical Reading course using learning management system, Schoology as teaching assistants and to investigate the impacts of digital literacy infusion to the participants in the course.

2. LITERATURE REVIEW

2.1. Digital Literacy

Digital literacy derives from literacy development in this digital era in responding to the development of technology and internet that causes people utilize digital devices to access, share, create information in digital form. This condition emerges new shape of literacy that is Digital literacy (DL). This term is coined by Glistler in 1997 highlighting the skills to comprehend and use information with various form and sources which are presented using computer. Moreover, Eshet-Alkalai (2012) elaborates the digital literacy skills into five areas and one of them is information skill which means ability to assess the quality and validity of information available on digital platforms. In detail, Leu et al. (2004) claims that new literacies of the Internet and other ICTs allow us to use them to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to other. This definition is wrapped up by Goodfellow (2011) statement that convey digital literacy as the individual awareness, attitude, and capability to utilize digital tools

to communicate and express social action in a particular life situation.

This specific circumstance triggers the establishing of DL frameworks which is initiated by the governments or institutions to response the needs of DL in their contexts. For instance, European commission establishes DL framework starting in 2010 with DigEuLit then it is redefined into DigCom 2.0 in 2013 with five core competence area such as information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. In 2017, DigCom 2.1 was released to provide more elaborations on proficiency levels and examples of use applied to learning and employment since this framework provides guideline for policy makers, educators, and employer to develop citizen DL competence (Carretero, Vuorikari & Punie, 2017). In addition, UNESCO defines DL as capability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technology. It covers four competences such as information literacy, computer literacy, ICT literacy, and media literacy (Woo, Torre, & Wong, 2018). The UNESCO concept is adopted by Indonesian government through its Ministry of Education that released National Literacy Movement in 2017 and DL is one out of six literacies emphasized (Ministry of Education, 2017).

2.2. Organizing Digital Literacy in Critical Reading

Critical reading is a reading activity beyond the reading comprehension since this reading requires reader to be able to explore information given by questioning, finding evidence, and validating assumption (Langer, 1990). Furthermore, critical reading attempts to critique logic, argument, and ideological assumption in the text. To be specific, critical reading forces reader to analyse a given text not only on what does a text say but also on a text does and means (Kurland; 2010). These activities are parts of cognitive skills in DL competences as Spante (2020) identify DL competence into three categories: operational, cognitive, and attitude. In the cognitive skill, it is obviously seen critical thinking roles as a crucial factor in cultivating and organizing DL. Moreover, critical thinking is cultivated through critical reading. As a result, infusing digital literacy to Critical Reading course is a prerequisite as suggested by Michalak, Rysavy, & Wessel (2017) and Bakermans, & Plotke (2018)

Some research finding confirms that students' digital literacy skill in higher education significantly influences to academic achievement since it also builds students' academic literacy and results in lifelong learners. However, it is found that incoming students generally over confidence of their digital literacy competence as

they consider themselves capable enough to operate basic computer and internet skills. In fact, most of them encounter hindrance in analysing and evaluating the information need for academic task completion. The confidence over DL derives from the students' experiences dealing with DL informally and they attain limited formal experience therefore DL must be integrated in any discipline or courses along with academic literacy building.

3. METHOD

3.1. Research Design

This study was conducted under case study framework since this framework is appropriate to investigate process and depict a certain phenomenon. This is in with the purpose of this study to portray the process of infusing digital literacy in English class as a general subject for engineering students in the first-year study.

3.2. Participants

The participants are 30 first year engineering students registered in Critical Reading course as a general subject. 17 of them are female and the rest are male students. They came from four different classes and voluntarily participated in this study. Most of them originate from big cities and the rest from suburban areas.

3.3. Data Collection and Analysis

3.3.1 Class Intervention

The class intervention is infusing DL competences particularly operational and cognitive competences into Critical Reading course syllabus through learning management system platform such as Schoology in form of blended learning. In this way, Schoology as a learning assistance to build DL competence as well as the core subject.

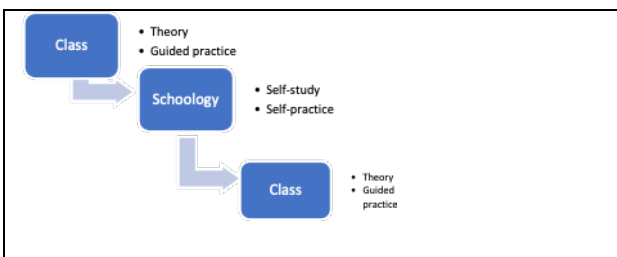


Figure 1. Course Design

Initially, teacher needs to sign up in Schoology website then creates a course. Inside the course there are some features provided such as Material, Assignment, Discussion, and Test. Document used as materials in this course are guideline in evaluating information on

internet and online articles containing argumentation or opinion. These documents function as additional materials to enrich material given in the class, therefore it provides students with broad knowledge on the discussed topic. This becomes sources for them to exercise the knowledge through independent task such as reading a self-chosen article and reflecting an opinion on the author's idea on the text then publish their work. The discussion is prepared for sharing opinion a reflection of meaning interpretation from the text. The phases are illustrated as follow:

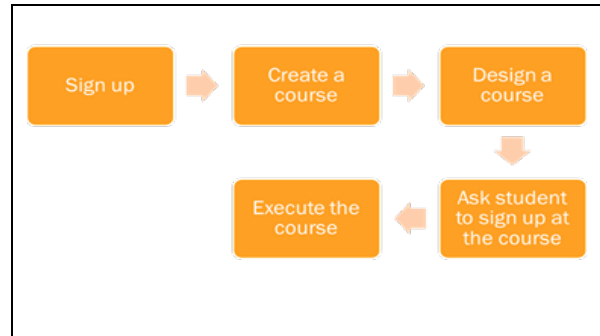


Figure 2. Designing Course in Schoology

The implementation started with introducing Schoology to the class and asking the students to sign up to the course. This is to ensure that everyone can enrol the course after that it was followed by a demonstration on how to use the course. This part is very crucial especially for those who are not familiar with Schoology. The course can be used as outside and inside classroom activities. Outside classroom activity is considered a virtual classroom where students still are capable of learning outside the classroom independently using the sources provided in the course. In this case, students were asked to do text based-writing activity by summarizing a given text and giving an opinion on the author's idea then published their work in the Schoology. As follow up, students share their experience in studying in the course in the class.

3.3.2 Class observation

This study purposes to integrate digital literacy in Critical Reading class using Learning Management System that is Schoology that provides online course therefore, classroom observation is necessary to take place to depict the process of the program implementation.

3.3.3 Questionnaire

The questionnaire explores the participants perception and experience in using Schoology as learning management system. This system is used in the Critical Reading course as a mean to infuse DL competences in the course. The participants' response is

intended to portray their competence in DL. There are 15 open-ended questions to garner the information needed. The questionnaire was delivered using google form at the end of the course.

Table 1. Questionnaire question sample

| |
|---|
| <i>It is the first time for you to use Schoology?</i> |
| <i>If No, when did you use it?</i> |
| <i>What problem did you have when you used it at the first time?</i> |
| <i>Do you think Schoology is useful for our class? Why?</i> |
| <i>Does Schoology help you to be independent learner? Why?</i> |
| <i>Which features in Schoology is the most helpful for you as student? Why?</i> |

3.3.4 Data Analysis

The data gathered in this study is analysed under the DigCom 2.1 framework published by European commission particularly certain competences such as information and data literacy, and communication and collaboration.

Table 2. Digital Literacy Competences based on DigCom 2.1 Framework

| Competence Areas | Competence Description |
|----------------------------------|---|
| Information and Digital Literacy | Browsing, searching, and filtering information, data, and digital content |
| | Evaluating data information and digital content |
| | Managing information, data, and digital content |
| Communication and Collaboration | Interacting through digital technologies |
| | Sharing through digital technologies |
| | Collaborating through digital technologies |

3.3.4.1. The first experience using Schoology

The participants’ response reveals that Schoology is a new learning application for them. It can be seen clearly from the chart that most of them were introduced to Schoology at the first time in this course while the rest had this experience in high school.

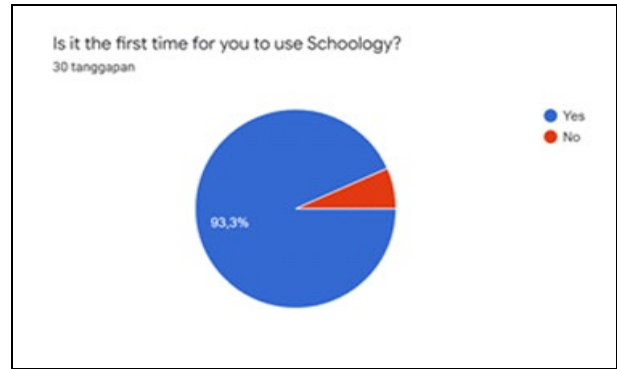


Figure 3. The first experience using Schoology

3.3.4.2. The Schoology benefits for students

Almost all participants agree that Schoology is very important for the course since they attain various beneficial experiences during utilizing it.

Do you think Schoology is useful for our class? Why?

“It makes works submission easier.”

“Not bound by place”

“It gave us the material that we had before in the class so if we could not understand well in the class, we can easily access the material that we do not understand.”

“We cannot lie for the late submission.”

“We can check our assignment every time we need.”

“We can do the task just by using handphone or laptop.”

“It makes us easier to communicate between the lecture and the students.”

“More organised with Schoology”

3.3.4.3. Autonomous learner

Autonomous learner is another significant benefit claimed by most of all participants with various reasons. It is obviously seen from the chart that 90% of them agree if Schoology helps them to be independent learners.

“The material provided in Schoology can be accessed without face-to-face meeting.”

“Because when there are assignments there are also the material, so if student did not understand how to solve the question, the material can help student to understand the question.”

“My lecture sent all of the materials to Schoology, so it helped me to study by myself”

3.3.4.4. Features’ benefits in Schoology

Schoology provides several features that function to cater the users’ needs in managing their learning activities. Those features are *Material, Assignment, Test, and Discussion*. The participants share their experiences in using all the features as described in the table below.

Table 3. The Schoology features and benefits

| Features | Benefits |
|------------|---|
| Material | <p>Reviewing the material given in the class outside the class</p> <p>Providing additional materials</p> <p>Enriching the knowledge related to the topics</p> |
| Assignment | <p>Organizing all work submission</p> <p>Monitoring all the assignment completion</p> |
| Test | <p>Monitoring learning achievement</p> <p>Testing discipline and honesty in completing the test or quiz</p> |
| Discussion | <p>Knowing other people opinion and argument</p> <p>Gaining more understanding on the materials</p> |

According to the participants, the most useful features in Schoology is Assignment and it is followed by the Material because of several reasons as explained below.

“It pushed us to do something even when we are too lazy to do it and as the results, we understand the material well”

“The Schoology helps us to recall the subject through the assignment”

“It taught me how to manage my time”

“It can be completed anywhere and anytime before the deadline”

All these experiences are supported by the management system configuration. The system gives teacher space to design a well organize teaching learning material and activities that trigger the students to be well organized learners.

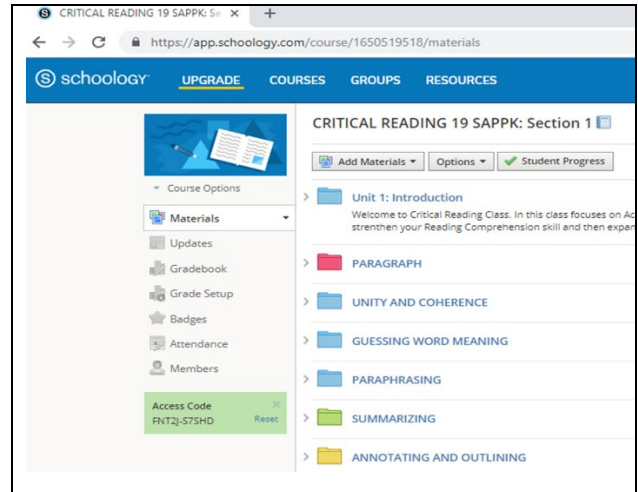


Figure 4. Course Layout

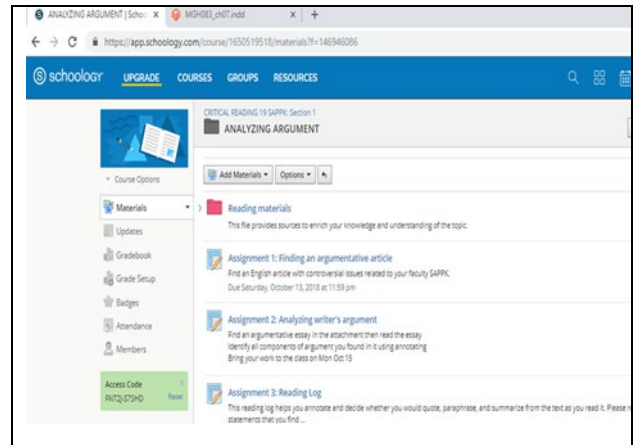


Figure 5. Layout inside a material folder

4. FINDINGS AND DISCUSSION

4.1. Information and data management

The most significant impact from infusing DL in the course through learning management system such as Schoology is information and data management. The system is configured to support classroom management that assists both teacher and learners to organize all information and data related to their teaching and learning activities during conducting and completing the course. For the learners, Schoology particularly for Assignment and Test features assist them to organize their works and learning achievement. As a result, they can keep track their work submissions and learning progress. In addition, this system supports paperless works since all works completed in or transferred into digital forms. These facts are claimed by almost 55% participants. This circumstance supports the academic achievement as suggested by Bakermans et.al (2018). Moreover, this learning management directs the learners become life-long learning agents as stated by

Anthony'samy, Koo, & Hew (2020) since the system aids the students to monitor their learning progress and the teacher to design the learning activities challenging the students to review the material given in the class and expand their knowledge and these activities are conducted outside the classroom.

For the teacher side, Schoology assists teacher to organize and document all the files associated with teaching materials and students' works therefore, tracking students' progress is not a matter anymore. Moreover, it provides a well-organized teaching journal as a result, it serves an ease for the teacher to evaluate the teaching and learning activities.

4.2. Communication using digital technologies

Another significant impact is communication through digital technologies in this case Schoology as LMS application. Classroom communication is one of crucial aspects in achieving the successful learning and in traditional classroom it merely takes place in the class. However, this communication nowadays can be conducted in a virtual class with assisted-technology devices. Giving and receiving feedback is the most important communication form revealed from the DL infusion to the Critical Reading course. Ordinarily, the feedback is delivered in the physical classroom in a rigid time schedule. Now, giving and receiving feedback are free from time and place boundaries and this happened resulting from classroom negotiation. Instead of feedback, Schoology provides a place for both synchronous and asynchronous discussions. These discussions are both teacher-students and peers discussions. In addition, it becomes a media to share other important information such announcement therefore it leads the class well-informed. It is obviously proven that class community is capable to have interaction and sharing using technologies.

All the benefits can be experienced by the class community if they are familiar with how to function all features available in the system. It is clearly seen that operational skill is also important to explore all benefits offered in the system. Previously, the participants were not familiar with Schoology since only a hand-full student used this in high school therefore they need time to be familiar with the system and encountered problems during utilizing it. However, along with the time, they get used to operate all features provided in the Schoology and experience the benefits from these features.

It is obviously seen that building and maintaining a good communication influence to the students' academic achievement and this is also supported by the students' operational skill level as Alt and Raichel

(2020) mentioned that students with a high digital literacy competence will seek out assistance by exploring the sources available in the internet if they are facing problem in learning in the classroom.

5. CONCLUSION

Infusing digital literacy through assisted-technology application such as Schoology to a course is possible and contributes valuable impacts to the course. However, it requires a well thought course design to dig out the precious benefits of technological device to reach the course aims. It is obvious that teacher's capability of digital literacy is one of success keys in utilizing the device in the classroom. As technology grows rapidly, teachers need to update their knowledge and competence related to digital teaching assistance and this becomes one of their aims in professional development.

Digital literacy is considered as an umbrella covering various kinds of literacy competence and this study merely focuses on certain competences therefore further research on other competences is required to provide a comprehensive understanding on the issue.

REFERENCES

- Alt, D & Raichel, N. (2020). Enhancing perceived digital literacy skills and creative self-concept through gamified learning environments: Insights from a longitudinal study. *International Journal of Education Research*, 101. <https://doi.org/10.1016/j.ijer.2020.101561>
- Anthony'samy, L., Koo, A.C., & Hew, S.H. (2020). Self-regulating learning strategies in higher education: Fostering digital literacy for sustainable lifelong learning. *Education and Information Technologies*, 25, 2393-2414. <https://doi.org/10.1007/s10639-020-10201-8>
- Avila, J., & Moore, M. (2012). Critical literacy, digital literacies, and common core state standards: A workable union? *Theory Into Practice*, 51(1), 27-33. <https://doi.org/10.1080/00405841.2012.636332>
- Bakermans, M. J., & Plotke, R. Z. (2018). Assessing information literacy instruction in interdisciplinary first year project-based courses with STEM Students. *Library and Information Science Research*, 40, 98-105. <https://doi.org/10.1016/j.lisr.2018.05.003>
- Belshaw, D. A. J. (2012). *What is 'digital literacy'? A Pragmatic investigation* (Doctoral thesis). Durham University. <http://etheses.dur.ac.uk/3446/>
- Bhatt, I. (2012). Digital literacy practices and their layered multiplicity. *Educational Media International*, 49(4), 289-301. <https://doi.org/10.1080/09523987.2012.741199>
- Colwell, J., & Hutchinson, A. (2015). Supporting teachers in integrating digital technology into

- language arts instruction to promote literacy. *Journal of Digital Learning in Teacher Education*, 31(2), 56-63.
<https://doi.org/10.1080/21532974.2014.991813>
- Eshet-Alkalai, Y. (2012). Thinking in the digital era: A revised model for digital literacy. *Informing Science and Information Technology*, 9, 267-276.
<https://doi.org/10.28945/1621>
- Goodfellow, R. (2011) Literacy, literacies, and the digital in higher education. *Teaching in Higher Education*, 16(1), 131-144.
<https://doi.org/10.1080/13562517.2011.544125>
- Ministry of Education. (2017). *Panduan gerakan literasi nasional*. Retrieved from
<https://gln.kemdikbud.go.id/glnsite/wp-content/uploads/2017/08/panduan-gln.pdf>
- Kurland, D. (2010). How the language really works: The fundamentals of critical reading and effective writing. Retrieved January 10, 2017, from
<http://www.criticalreading.com/>
- Kurnia, N., & Astuti, S. I. (2017). Researchers find Indonesia needs more digital literacy education. *The Conversation*. Retrieved from
<https://theconversation.com/researchers-find-indonesia-needs-more-digital-literacy-education-84570>
- Langer, J. (1994). Focus on research: A Response-based approach to reading literature. *Language Arts*, 71(3), 203-211. Retrieved March 1, 2021, from
<http://www.jstor.org/stable/41961954>
- Law, N., Woo, D., Torre, J., & Wong, G. (2018). A global framework of reference on digital literacy skills for indicator 4.4.2. UNESCO institute for statistics. Retrieve from
<http://uis.unesco.org/sites/default/files/documents/i51-global-framework-reference-digital-literacy-skills-2018-en.pdf>
- Leu, D. J. (2004). Research on instruction and assessment in the new literacies of online reading comprehension. In S. B. Neuman & L. B. Gambrell (Eds.), *Quality reading instruction in the age of common core standards*. The International Reading Association.
- Martin, A & Grudziecki, J. (2015). DigEuLit: Concepts and tools for digital literacy development. *Innovation in Teaching and Learning in Information and Computer Sciences*, 5(4), 249-267.
<https://doi.org/10.11120/ital.2006.05040249>
- Michalak, R., Rysavy, M. D. T., & Wessel, A. (2107). Students' perceptions of their information literacy skills: The Confidence gap between male and female international graduate students. *The Journal of Academic Librarianship*, 43, 100-104.
<https://doi.org/10.1016/j.acalib.2017.02.003>
- Reichert, M., & Mouza, C. (2018). Teacher practices during Year 4 of a one-to-one mobile learning initiative. *Wiley Journal of Computer Assisted Learning*, 34(6), 762-774.
<https://doi.org/10.1111/jcal.12283>
- Spante, M., Hashemi, S. S. & Algers, A. (2018) Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent Education*, 5(1), 1519143.
<https://doi.org/10.1080/2331186X.2018.1519143>
- Suherdi, D., & Mian, Y. (2017). Toward establishment multicontext information and communication (ICT) training. *English language teaching and technology journal*, 1(1), 1-11. Retrieve from
<http://ejournal.upi.edu/index.php/ELTTech/article/view/9426>