Self Assessment on Students' Digital Competency in Academic Writing Course in Papua Context

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Abstract: Self-assessment on Students' Digital Competency in Academic Writing Course in Papua Context. Objectives: This study aims to portray the digital competency of higher students in Papua. **Method:** The questionnaire related to digital competence measurement was distributed to 200 students in one of a state university in Papua. **Finding:** This study found that students' digital competence, which includes hardware mastery, software mastery, self-competence, digital security, digital cooperation, and digital development mastery, is at a moderate level (x 3.1). Moreover, particular gender types and ethnicity are more superior compared to others. **Conclusion:** The result of this study also indicates that the digital competency of higher students calls for serious attention to improvement. Furthermore, the findings of this study are possible to be elevated into the next stage of developing learning models to improve digital competencies for preparing students for mastering academic literacy that will be beneficial for their academic life.

Keywords: academic literacy, information literacy, digital competence, Papua.

Abstrak: Penilaian Mandiri terhadap Kemampuan Digital Mahasiswa pada Mata Kuliah Menulis Akademik pada Konteks Papua. Tujuan: Penelitian ini bertujuan untuk menggambarkan kompetensi digital para mahasiswa di Papua. Metode: Kuesioner terkait pengukuran kompetensi digital dibagikan kepada 200 mahasiswa di salah satu PTN di Papua. Temuan: Hasil penelitian menemukan bahwa kompetensi digital siswa yang meliputi penguasaan hardware, penguasaan software, kompetensi diri, keamanan digital, kerjasama digital, dan penguasaan pengembangan digital berada pada level sedang (x 3.1). Selain itu, jenis gender dan etnis tertentu lebih unggul dibandingkan dengan yang lain. Kesimpulan: Hasil penelitian ini juga menunjukkan bahwa kompetensi digital mahasiswa perlu mendapat perhatian serius untuk ditingkatkan. Lebih lanjut, temuan penelitian ini memungkinkan untuk dikembangkan ke tahap selanjutnya dalam pengembangan model pembelajaran untuk meningkatkan kompetensi digital guna mempersiapkan siswa menguasai literasi akademik yang bermanfaat bagi kehidupan akademiknya.

Kata kunci: literasi akademik, literasi informasi, kemampuan digital, Papua.

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■ **INTRODUCTION**

The success of students in the academic context is inseparable from the academic abilities of the students. Specifically, upper semester students are expected to be able to complete the final project in the form of an undergraduate thesis writing that demands functional academic literacy skills. However, most students have obstacles in finding material for writing a thesis (Hyland & Shaw, 2016), which makes the process of writing demand a long time, and it is difficult to be done (Paltridge & Starfield, 2013). Previous research has shown that students have obstacles in the context of information literacy, which consists of finding, evaluating, and using various sources of information (Berzonsky & Richardson, 2008; Chowdhury, Gibb, & Landoni, 2011; Dubicki, 2010). Lack of sufficient information literacy skills will result in serious problems faced by students in the form of graduation delays to the threat of dropouts.

The level of different information literacy competency among students correlates with students' writing abilities. With adequate information literacy skills, students will avoid dependence on poor reference sources from internet searches (Williams, Fieldhouse, & Rowlands, 2008) because they can identify quality articles that are relevant to student projects (Berzonsky & Richardson, 2008) which are justified the information is based on the ability to think critically (Scott & Simmons, 2006). However, not all students have sufficient information literacy competence to support the academic life of students. MacMillan and MacKenzie (2012) have identified that students suffer from poor information literacy as well as academic literacy because they have obstacles to finding the right article, reading, and using that information on student academic goals. Moreover, the limited quality and relevant articles that are mostly presented in English make

students more frustrated, especially in the undergraduate thesis writing activities.

The ability of student information literacy is not a single circumstance to be improved through learning because the indicators of this ability are influenced by many factors. Difficulties in information literacy competency are not only experienced by both regional and international students (Wingate & Tribble, 2012). The ability of students to read academic texts and the ability to practice writing is very closely related to gender, culture, and educational background (Lillis, 2002). Moreover, the same view was expressed by previous research which identified that gender has a role in the ability of information literacy (Gravill, Compeau, & Marcolin, 2006; Hohlfeld, Ritzhaupt, & Barron, 2013; Nahyun & Hana, 2017; Prihandoko, 2019). However, research findings also underline that information literacy is independent without gender influence (Anggawirya & Prihandoko, 2020; Mahmood, 2013; Tsai & Tsai, 2010; Yi, 2007). The previous studies related to the influence of gender and the ability of information literacy may not be generalized to a wider scope related to student academic life.

The ability of information literacy is crucial to be mastered by students through independent learning or intervention from the university. The university should be able to be a pioneer in improving information literacy competency with a long-term goal of having students autonomous when dealing with all projects that require sound and quality sources of information (Shenton & Fitzgibbons, 2010). The ability of information literacy is a shared responsibility in a wider scope of academic literacy (Beard & Dale, 2010). A harmonious synchronization between librarians and the academic life of students is needed (Broady Preston, Tedd, & Pinto, 2012). Librarians have a responsibility to get out of their comfort zones to be able to work with students in various disciplines (Lahlafi, Rushton, &

Stretton, 2012). Gunn, Hearne, and Sibthorpe (2011) added that academic ability is formed from the collaboration between the academic community consisting of librarians, staff, and academics. Students become the main actors in obtaining information literacy competency, need solid support from academia, where students carry out their studies. The importance of information literacy for students to succeed in their academic lives has received special attention from previous studies. In the global sphere, Broady Preston et al. (2012) describes the behavior and perceptions of students majoring in history toward information literacy. Also, active learning carried out by students with module support can improve the information literacy and academic abilities of international students (Lahlafi et al., 2012). Moreover, belief in importance and self-efficacy is an important part of the core capabilities of information literacy (Pinto, 2016). Guzmán-Simón, García-Jiménez, and López-Cobo (2017) found the context of academic literacy, which lacked support from universities through ICT involvement and information literacy. Meanwhile, Akayoglu, Satar, Dikilitas, Cirit, and Korkmazgil (2020) found that teaching staff and the use of social media as learning media affect the level of digital literacy skills of students. Previous research in the global realm suggested that the ability to equip information literacy to students was influenced by internal and external factors of students.

Studies related to information literacy are not limited to the global sphere, especially in Indonesia itself. There have been several studies relating to information literacy. Hasanah and Rachman (2019) underlined the important role of librarians' abilities in meeting the information literacy needs of users. Integrated science learning materials can improve critical thinking skills and information literacy among senior high school students (Fairuz, Kaniawati, & Sinaga, 2019). On the other hand, Berutu, Delita, Astuti, Novira,

and Wirda (2019) improve the ability of information literacy through involving libraries and digital information sources. In addition, Fuad and Fuad and Hamid (2019) found that the ability of digital information literacy by lecturers was at a moderate level. Based on the regional context, so far, research related to information literacy in Indonesia is limited to the application of several experiments to improve information literacy capabilities, cross-sector involvement in improving information literacy abilities, and the level of digital information literacy lecturer capabilities. Also, in the context of the Indonesian region, especially in the east, which has socio-demographic conditions that are different from the western regions, tend to be uninvestigated by previous research. A study is needed to explore the ability of information literacy related to academic literacy in the context of rural areas such as eastern Indonesia.

This prospective study is designed to frame the academic literacy of students concerning explore the level of students' digital competency as one element of academic literacy. Digital competency is part of mastery of reading skills that act as indicators of success for academic achievement (Shaw & Pecorari, 2013). Moreover, the ability to read to write reading for writing (RFW) will be used by students to obtain the knowledge and skills needed to write effectively (Hyland & Shaw, 2016) especially to be applied to undergraduate thesis writing for achieving academic goals. With the information obtained from this study, it is expected that this information can provide the basis for a more effective policy for improving students' information literacy competency.

Information literacy is a competency that must be possessed by everyone in today's digital era. Currently, various countries in the world are aggressively demanding the information literacy competency of their citizens (Pinto, 2016). These countries assume that

information literacy is a complete package to prepare its citizens to face the challenges of the world in the future. The sophistication of devices, such as smartphones, tablets, and laptops, is the ease of facilities obtained by modern society, which should also have an impact on increased information literacy competency (Pinto, 2016; Prihandoko, Nurkamto, & Marmanto, 2018; Shannon, Reilly, & Bates, 2019). Today's world community already has information literacy and uses it daily. For example, seeing book and movie reviews, accessing and uploading videos to YouTube, seeing product reviews, seeing ways of parenting through videos or articles (Hisle & Webb, 2017). Based on this circumstance, that the ability of individuals to access the information needed, allocate, evaluate, and use that information has emerged. It is a new fact that modern society already has a fairly good level of information literacy, even though the setting is informal.

At the beginning of its emergence, information literacy only rests on terms that are conical in the library and its staff. In the last 30 years, the term information literacy has become popular in the academic world. However, awareness to teach it in the new class emerged in 2002 (Shannon et al., 2019). The teacher starts to look for ways to teach information literacy that, at first glance, seems simple, but it is also quite complicated. When talking about information literacy, the terms that follow are always related to searching, evaluating, processing, and communication dissemination information. Multiple stages and processes ultimately raise a big question mark in the world of education about how to teach information literacy in the classroom and what challenges arise in practice (Pinto, 2016). In the academic world, educators need to ensure the curriculum can accommodate and develop abilities students so students can demonstrate their ability to complete assignments based on their competency (Mueller, 2012).

In the academic world, information literacy has a key role in making students successful. There are three main components in student academic development consisting of self-efficacy, motivation, and information literacy (Ross, Perkins, & Bodey, 2013). Furthermore, these three components also influence students' abilities and preferences in choosing learning resources (Printo & Pascual, 2017). Students need the ability to search for information to effectively communicate that information through the process of analysis to the organization of information (Guzmán-Simón et al., 2017). Moreover, this ability becomes the most representative ability in the academic world if accompanied by decent digital competency (Goodfellow, 2011).

In supporting academic literacy competency, in addition to information literacy competency, digital competence also plays an important role in shaping academic literacy. People interpret digital competency into digital literacy and vice versa. Though both have very different meanings. Before digital literacy became popular, digital competence first gained popularity around 2010 (Machin Mastromatteo, 2012). Digital competence is defined as creativity in using IT, which in practice helps to obtain and update the required skills. Digital competence is used as capital to transform its citizens into digital citizens who need mastery in the field of information to produce content and problem-solving abilities without forgetting the security element (Janssen et al., 2013).

Digital competence, which is the ability of digital literacy, is a mandatory requirement in the work-field because of the need to learn the abilities used in this area (Ala-Mutka, 2011). Moreover, digital competence is also a requirement for the ability to be able to interact with digital citizenship (Van Deursen & van Dijk, 2009). Moreover, digital competency is also cognitive abilities that

involve the use of digital devices for specific purposes according to practical needs (Sicilia et al., 2018). Mastery of digital competency is a necessity for students because not only will it be used in an academic context, and it will be used by students in their future professional careers.

Mastery of digital competency and information literacy become part of digital literacy. Tuamsuk and Subramaniam (2017) underline that technical, cognitive, and emotional-social skills become a key part in the formation of digital literacy abilities. On the other hand, digital literacy requires the mastery of ICT and the internet with the aim of receiving, regulating, integrating, and communicating information obtained in order to be able to play a role in the knowledge society (Parvathamma & Pattar, 2013). Digital literacy is a key component for students in the academic world. Students are required to have the competence to be able to survive in an era that is dominated by information and communication in digital form (Littlejohn, Beetham, & McGill, 2012).

In carrying out digital literacy capabilities, to obtain information, especially from the internet, the ability to use online information searching strategy (OISS) is required. OISS is a skill that must be possessed by students. When talking about OISS, the main concept that must emerge is the interaction of various search systems to be able to use various popular information search engines (Kurt & Emiroglu, 2018). OISS requires digital literacy capabilities, in which students have the power to manage, assess the relevance, and reliability of the information that they access from the website (Istance & Kools, 2013). Moreover, OISS cannot stand alone because it is closely related to high internet self-efficacy level students. Even proven, students who have high levels of self-efficacy have better information and learned better than those who have low internet self-efficacy (Tsai & Tsai, 2010). Students who frequently interact with technology will influence

cognitive absorption. The better the critical analysis that it has, the more it will continue to be motivated to search for more information.

Besides being related to the self-efficacy of students, OISS is also closely related to digital literacy. Digital literacy is an important factor in information search skills (Lea, 2013). People who have high digital literacy capabilities will be able to give their arguments precisely and well and can easily find and determine the desired information (Lea & Jones, 2011). Another factor that also determines online searching strategies is the type of information students commonly look after. Students who are accustomed to accessing daily life information will be better at obtaining information than those who only dwell on information relating to learning activities (Atoy Jr et al., 2020).

■ METHODS

This research is a quantitative descriptive study that aims to explore the level of digital competence possessed by students in one of the tertiary institutions in Papua. The respondents of this study were students one of a state university located in Papua province. Data obtained by simple random sampling through online questionnaires using Google Form. The questionnaire link is distributed to students through the WhatsApp group, and the questionnaire filling time is done in two weeks on March 2-16, 2020. Based on the online questionnaire that has been distributed, a total of 200 responses have been collected.

The online questionnaire distributed to respondents contained 22 questions that were adapted from several previous studies (Atoy Jr et al., 2020; Iordache, Mariën, & Baelden, 2017; Motyl, Baronio, Uberti, Speranza, & Filippi, 2017). The questionnaire contains student demographic information in the form of gender, ethnicity, and devices owned by students and self-assessment of students' digital abilities. The

questionnaire is presented in Indonesian to make it easier for respondents to fill out the questionnaire.

■ **RESULT AND DISCUSSION**

The researcher presents demographic information of the respondents is discussed before the researcher describing the result. The demographic description of the respondents is described in Table 1.

Table 1. Respondents Demographic Information

Variables	N	%
Gender		
Male	95	47.40
Female	105	52.60
Ethnicity		
Non-Papua	169	84.60
Papua	31	15.40
Owned Devices		
Laptop	115	57.70
Smartphone	182	91
Tablet	8	3.80
Basic Phone	10	5.10

In addition, the researcher ensures the instrument is reliable and valid based on several steps. The reliability and validity had been tested through the smartpls application shows that the

Table 2. Reliability and Validity Measurement

Variables	Cronbach's Alpha	Average Variance Extracted (AVE)
Hardware Mastery	0.762	0.591
Software Mastery	0.901	0.773
Self-Competence	0.823	0.681
Digital Security	0.873	0.797
Digital Cooperation	0.942	0.853
Digital Development Mastery	0.727	0.639

adapted questionnaire has a decent level of reliability (> 0.7) and validity (> 0.5) (Wong, 2013) as it is seen in Table 2. The data obtained is processed through various stages. Data from google form will be saved in the form of .xls. Then, responses from students will be processed using IBM SPSS 23 software to display the mean and standard deviation. The results of the processed data are then interpreted using the digital competency framework as follows x 0.0-1.7 (low competency), x 1.8-3.7 (moderate competency), x 3.8-5.0 (high competency).

The results of the self-assessment of students' digital competencies are shown in Table 3. Mastery of hardware is one variable of digital competencies. Hardware mastery is needed not only to recognize the device but also to recognize the features of the device. In general, the level of mastery of hardware is at a moderate level (x = 3). It was found that mastery over smartphone usage and the ability to connect devices with a WIFI network was the most accessible hardware mastery for respondents (x = 3.4). However, the mastery of digital devices globally is quite significantly different from other indicators of hardware mastery (x = 2.3).

Table 3. Digital Competency Self Assessment

Variables	Indicators	$\bar{x}$	σ
Hardware Mastery	I know and am able to use various hardware	3.1	0.9
	The ability to master digital devices is what I need	2.3	1.3
	I am able to operate a smartphone to download applications & install applications	3.3	0.5
	I am able to use my device to connect to the WIFI network	3.4	0.5
Software Mastery	I have mastered the ability to handle digital structures	3.0	1.0
	I mastered using a		

	browser to open a new tab and return to the previous page	2.9	1.3
	I am able to use my device to upload, download files, store photos	3.3	0.6
	I master the use of Microsoft Office (Word, PowerPoint, Excel)	3.9	1.3
Self-Competence	I have the knowledge and able to use the internet	3.1	0.5
	I was able to seek help through the internet independently	3.1	1.4
	I have cross-platform navigation capabilities	3.2	1.1
	I can solve technical problems independently	3.2	1.1
Digital Security	I have knowledge of device safety	3.1	1.2
	I have mastered the ability to master the knowledge related to the protection/privacy of personal data	3.4	1.0
	I understand using a browser to bookmark sites and set privacy policies	3.4	1.5

Besides mastery of hardware, the ability to master the software is also an essential variable of digital competencies. There are differences in the level of mastery of hardware and software by respondents. The level of mastery of the software by respondents are, on average, exceeds the level of mastery of hardware (x = 3.3). The aspect to note is that the respondents use of Microsoft Office (x = 3.9) more cleverly compared to other software mastery. In addition, the level of ability to download and upload is also at a moderate level (x = 3.3). Moreover, on average, there is no significant difference between the mastery of using a browser and handling digital structures (x = 3).

In digital competencies, self-competence becomes a vital variable to master. Self-competence in this study is related to the ability to master the internet, cross-platform navigation, and self-troubleshooting. The ability of respondents' internet mastery is at a moderate level (x = 3.1). Besides that, the level of mastery of cross-platform navigation and self-troubleshooting has an equivalent level (x = 3.2).

The critical competency that needs to be mastered in other digital competencies is the awareness of data security. This knowledge is considered necessary because smooth connectivity will also pose various threats. In general, the level of respondents' digital security knowledge is the same as the level of self-competence (x = 3.2). Respondents have knowledge related to data privacy at a moderate level (x = 3.4). Meanwhile, respondents' knowledge related to the security of the device is at a level that is not much different from data privacy (x = 3.1).

Variable of digital collaboration is a component of digital competencies. Respondents are at a moderate level regarding their ability to work together using cloud computing, video-calls, and email usage (x = 3.1). The ability of respondents through social media to work together is at a moderate level (x = 2.9). It was found that the digital literacy level of respondents to read documents online was quite different from the ability to use cloud and email computing (x = 1.8). However, in general, the respondent's digital collaboration ability variable was quite low compared to other competencies variables (x = 2.7).

Digital competence is supported by the ability to follow technological developments. Students need to follow the development of technology to be able to improve their digital skills. On average, the ability of respondents to

follow technological developments is at a moderate level (x = 3.4). Respondents have sufficient ability to follow technological developments (x = 3.7). Also, respondents' mastery and knowledge related to new technology are at a moderate level (x = 3.2).

After elaborating on respondents' digital competency levels based on variables, this study expands the discussion by including other variables in the form of gender and ethnicity, as it is seen in Table 4. In the gender variable, on average male has a better mastery of digital competence than female (x = 3.4). Furthermore, regarding the average distribution of each variable, there is no significant difference between the digital capabilities of the gender. On the other hand, based on ethnicity variables, there are differences between Papuans and non-Papuans ethnic. The level of digital competencies of Papuan ethnic is lower compared to non-Papuans (x = 2.8). In general, in the ethnicity variable, the distribution of digital capabilities does not have a significant difference except in hardware (x =2.1).

Table 4. Digital Competency Based on Gender and Ethnicity

Variables	Gender		Ethnicity	
	M	F	Papua	Non-papua
Hardware Mastery	3.3	3.2	2.1	3.3
Software Mastery	3.6	3.3	2.8	3.3
Self-Competence	3.4	3.3	2.9	3.2
Digital Security	3.5	3	3	3.2
Digital Cooperation	2.8	2.7	2.5	2.8
Digital Development Mastery	3.5	3.3	3.2	3.4
Total $\bar{x}$	3.4	3.1	2.8	3.2

This present study is intended to determine the level of digital competence of students in Papua through self-assessment. Respondents have a moderate level of hardware mastery.

Respondents have decent skills in mastering smartphones. On the other hand, mastery of software has a better level than hardware mastery. The software mostly mastered by respondents is Microsoft Office. Also, the self-competence of respondents regarding internet use and troubleshooting is at a moderate level. The Self-competence of respondents is directly proportional to the understanding of data security issues. Moreover, the respondent's digital collaboration skills and the respondent's ability to follow technological developments are at a moderate level. In addition, the perception of the level of digital competence in certain ethnicities and genders has differences with other ethnicities and genders.

On average, the level of digital ability of respondents is at the middle level. Findings from research related to student digital competency levels are consistent with findings on the subject of teaching staff (Fuad & Hamid, 2019). The development of digital capabilities contributes to academic literacy skills (Lea & Jones, 2011), where these abilities require students to adjust to the use of digital media that requires new pedagogy skills (Cope & Kalantzis, 2000). In supporting the improvement of academic literacy skills in the university context, policies must be issued to present concepts and strategies to address the challenges that have been increasing in the last decade (Merchant, 2013). The availability of digital equipment and internet access facilities is suspected to influence the level of digital competence of respondents. Also, the motivational aspect contributes to the mastery of ICT (Guzmán-Simón et al., 2017), which are related to digital capabilities.

Hardware, software, and security aspects are crucial in digital competence. With this capability, digital competencies that are useful for exploring and dealing with new technology can be done more dynamically (Morellato, 2014). In addition, digital competency focus on certain skill

levels in using technological devices that include computers, software, and the internet (Gunn et al., 2011), which are useful for obtaining and re-creating information to produce new knowledge, especially in academic contexts (Cazco, González, Abad, Altamirano, & Mazón, 2016). The process of students to gain mastery of the ability of hardware, software, and aspects of data security is not only an obligation of educators but also students are required to become independent learners in mastering digital capabilities. Moreover, the acquisition of digital competency is not limited to the university context, because the process of acquisition is complex which involves various domains such as the academic and social domains derive from house involvement to colleagues (Guzmán-Simón et al., 2017; Meyers, Erickson, & Small, 2013).

Digital competency not only requires mastery of hardware, software, and data security capabilities but also requires the ability to work together digitally and also follow technological developments. (Ferrari, Breèko, & Punie, 2014) identify that communication and collaboration become key components in digital competency. Moreover, the ability to collaborate digitally has a close relationship with the workplace with certain types of work and practical tasks (Sicilia et al., 2018). Thus, there has been a global consensus that the development of digital capabilities is indispensable in workplaces comprising a variety of different sectors (Benson, Johnson, & Kuchinke, 2002). Also, Universities should not only pay attention to the hard skills aspects of students related to the technical knowledge they get from their majors. Mastery of digital competency that contributes to digital literacy capabilities with the ultimate goal of academic literacy competency requires special attention. Digital competency should be the initial foundation in learning because it is one of the main keys in higher education that contributes

to the formation of students' abilities for future professional careers (Printo & Pascual, 2017).

Other findings from this study are also related to previous research, which views gender as affecting the mastery of digital competency. Gender factors influence digital competencies, which are the findings of this study have also been disclosed in several previous studies (Balta & Duran, 2015; Ýlkan, Beheshti, Rahimi, & Atalar, 2017). On the other hand, ethnicity also contributes to the mastery of digital competencies are in-lined with the findings from previous studies (Esteve-Mon, Llopis, & Adell-Segura, 2020). Gender and ethnicity should be a concern for educators in determining learning strategies in order to equip students before entering into the developing world of industry. With the suitability of learning materials that encourage active learning in the classroom, stimulate students to become autonomous learners outside the classroom, and pay attention to gender and ethnic aspects, it is hoped that the digital competency of students can be improved and become provision for success in academic life and professional careers in the work-field.

There are various limitations in this study because the purpose of this study is to conduct an initial exploration of the level of digital abilities of students, specifically in rural areas, namely Papua. The research is limited, focusing on initial exploration for portraying the empirical conditions of students in Papua. The findings of this study have broader implications, especially for all stakeholders involved in higher education, which are not only limited to government agencies but also the private sector. Further research is needed to find solutions to improve students' digital competency based on need analysis from the work-field as well as students' current condition. Research in the form of developing learning models to the application of the curriculum is needed to provide comprehensive action to improve the digital competencies among students,

especially in eastern Indonesia, which has different characteristics from western Indonesia.

■ CONCLUSION

Based on this study, the self-assessment of student digital competence at one of the tertiary institutions in Papua is at a moderate level. Further policies should be undertaken to respond to these findings to be able to enhance further the digital competence of students in order to prepare for professional abilities before plunging into a world of an industry that continues to transform. Other findings from this study indicate that certain gender and ethnicity require more attention to be able to improve digital competence. Action through policy in the form of matriculation is needed to balance the existing imbalances. Increased digital competence is expected to provide provisions for students and also be following the needs of professional abilities in the industrial world.

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