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EXAMINING OF INFORMATION LITERACY AND SCIENCE PROCESS SKILLS TOWARDS GRADE POINT AVERAGE: A PRELIMINARY RESEARCH

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ABSTRACT

Information Literacy (IL) and Science Process Skills (SPS) have been widely examined to enhance the quality of learning, especially in higher education, in which information technology has become the basis of human life. This research aims to explore the relationship between IL and SPS to the grade point average (GPA) of pre-service science student. Determination of samples using a typical case sampling is 278 students from 329 active students in the program at S1-Science Education, Surabaya State University (UNESA). This research uses quantitative approaches. The source of data is a test result of IL and SPS towards a GPA in the odd 2017/2018 semester. The data were analyzed using the Minitab 16 program. The results of the data analysis showed that = 26,69 > 3,03 = = (0,05;2;275) or in other words support data to reject with confidence level 95%. This investigation concludes that there is a significant relationship between variable information literacy and science process skills together against the grade point average. The results of the research are expected to be one of the considerations in choosing and determining the right learning of science teachers,

Keywords: ***Information Literacy (IL), Science Process Skills (SPS)***

Introduction

At present, global trends have entered the era of industrial revolution 4.0 marked by the utilization of Information and Communication Technology (ICT) in various aspects of life (Kemristekdikti, 2018c). The emergence of globalization, technology, migration, international competition, global market changes, transnational environment and political change all lead to the need for the skills and knowledge required by students to succeed in this era (Zubaidah, 2016). It is deemed urgent to prepare qualified graduates and be able to compete globally and master the technological development of being important to the people and the future of a country (Kanematsu & Barry, 2016). Departure from that context, the ability of information literacy and the development of scientific research skills or process skills is one of the most important of life skills.

The era of industrial revolution 4.0, with the phenomenon of disruptive innovation, is one of the challenges of higher education, predicted the working world would replaced by automation and control using information technology. About that, preparing citizens and labor to live in digital age depends on the excellence of society, the quality of daily life, economic life, and competitiveness; everything that can be developed through good education (Suwono et al., 2017). The education system in this age focused on the commitment to support students as innovators (Igwe et al., 2014) and change agents in higher education. However, keep in mind that preparing students to work, being a good citizen and capable of facing life in this era is a struggle (Zubaidah, 2016) and not an easy thing. One of the paradigm shifts about the importance of learning that emphasizes IL on students to a knowledge-based economy has revealed by educators and entrepreneurs (Schroeter & Higgins, 2015). A strong literacy capability equips students with the potential to grow and develop into individuals and more skilled and more experienced scientists facing the challenges of the future (Daria, 2017**).** It traces information literacy in learning and provides skills for research independently (Schroeter & Higgins, 2015).

Information literacy is one of the high-level intellectual skills required for the development and success of academic, professional and personal (Shao & Purpur, 2016). Therefore, information literacy is important to take, assess, and provide the right information to grow informatics to students (Liou et al., 2015). According to that view, Association of College and Research Libraries (ACRL) defining information literacy is the ability the individual needs to recognize when the information is needed and can find, evaluate, and effectively use the information needed. Defining information literacy is an individual's ability to recognize when the information is needed and can search, evaluate, and use the information required (Ukachi, 2015). Whereas the variable of IL in this study is (1) determining the source of information; (2) determine the type of information; (3) strategies for accessing information; (4) devices access information through the internet; (5) evaluating internet resources; (6) evaluating the resources of the book; (7) conduct a written review (3 questions); (8) the mastery of the term in the study; (9) copyright issues, and (10) bibliographies (Shao & Purpur, 2016, Chatzilia & Sylaiou, 2013).

Regarding the context of the Mandate from Presidential Decree No. 2 the Year 2015 on the National Medium-Term Development Plan (2015-2019) stating that the role of the Science and Technology is expected to contribute

significantly to the national economy (Kemristekdikti, 2017a). In addition, one of the most important goals of educational science is to teach students how to engage in research. In other words, students must integrate skills, knowledge, and attitudes to develop a better understanding of the concept of science (Zeidan & Jayosi, 2014). The SPS is the basis of the skills to master science (Prayitno et al, 2017) and gut is important in the process of science learning (Moore, 2003) to develop knowledge (Hafizan & Halim, 2010) and the basis of scientific thinking and research (Mutlu & Temiz, 2013). In addition, science process skills are the thinking skills we use to obtain information (Karamustafaoğlu, 2011). Therefore, science process skills are the skills that need to be instilled, practiced and owned by students (Wahyuni et al., 2017). That way, the science process skills can potentially be a means to sharpen students' thinking skills.

The SPS is classified into the basis and integrated (Zeitoun & Hajo, 2015). Basic science process skills are the skills to observe, summarize, classify, communicate, measure, and predict (Prayitno et al., 2017) While the components of integrated process skills are identifying variables, identifying hypotheses, defining operational variables, designing investigations, graphing, and interpreting data (Hafizan & Halim, 2010). A similar reference describes science process skills including observing, classifying, researching, hypothesis, identifying variables, designing experiments, interpreting data, and drawing conclusions (Jeenthong, Ruenwongsa, & Sriwattanarothai, 2014), measure, use numbers, identify space or time relationships, predict, communicate, define variables, define variables on an operational basis, experiment (Kruea-In & Thongperm, 2014). The science process skills indicator (1) identifies the problem statement; (2) identify the design of the experiment; (3) identify hypotheses; (4) prediction analysis (5) to analyze the way data collection; (6) identifying adjustment data; (7) identifies the data of the analysis; and (8) analysis of conclusions.

Departing from the above opinion, the purpose of this study is to explore the relationship between IL and SPS to the cumulative achievement index on students of science teacher candidates. The results of the study expected to be one of the considerations in choosing and determining the right learning of science teachers, especially in UNESA.

Research Method

Determination of samples with typical case sampling techniques, the purposive sampling type is useful when a researcher wants to study a phenomenon or tendency associated with "typical" or "average" members of the population (Crossman, 2017). All respondents taking the test are categorized as research samples. The sample of this study involved 278 (84.5%) students of Science University of Science in Surabaya (UNESA), 2017 (semester 1), 2016 (semester 3), 2015 (semester 5), and 2015 (semester 7) in academic year 2017/2018, of the total active student population (329). This quantitative study was conducted as a survey, which has three basic characteristics: (1) collecting data (2) from the sample (3) by submitting a test, to illustrate its aspects (Fraenkel, Wallen, & Hyun, 2012).

The instruments developed include the IL test (42 questions) and the test skills science test (27 questions), while the cumulative achievement indicators are categorized from the database science study program. The distribution of information literacy tests is (1) determining source information (3

questions); (2) determine the type of information (3 questions); (3) strategies for accessing information (3 questions); (4) devices access information through internet (3 questions); (5) evaluate internet resources (3 questions); (6) evaluating the resources of the book (3 questions); (7) research report writing (3 questions) (3 questions); (8) the mastery of the term in research (12 questions); (9) copyright issues (3 questions), and (10) Bibliographic variants (4 questions) While the science process skills test, the distribution is (1) identifying problem or problem formulas (3 questions); (2) identify the design of the experiment, including (a) the determination of variation of manipulation, (b) varying responses, (c) variable control, (d) variable operational definitions, and (e) tools and materials; (3) identify hypotheses (3 questions); (4) prediction analysis (3 questions); (5) analyzing the application of statistical methods including (a) collecting data, (b) delivering data, (c) analyzing data (9 questions); and (6) analyze with drawal conclusions (3 questions). All the questions are a multiple choice question. The process of analyzing data using a descriptive method by using Minitab 16 program. The categorization of correlation coefficient: no relationship (0.00); relationship is less significant (0.01—0.29); weak relationship (0.10—0.29); moderate relationship (0.30—0.49); strong relationship (0.50—069); very strong relationship (0.70—089); perfect close relationship (>0.90) (Drezner, 1995).

Results and Discussion

Rapid, accurate, and easy access to information is a necessity for student, educator, and almost in modern social life. In this regard, information literacy skills needed in today's information age. Hence his knowledge and mastery of technology are urgent to develop in learning always be able to survive even superior in global competition. In the era of globalization, many people's lives influenced by the development of knowledge and technology (Putra, Widodo, & Jatmiko, 2016). Analytical dissemination The IL and SPS to GPA is shown in Table 1.

Table 1. Analysis of LI and SPS correlation to GPA

	Variable	IL	SPS
SPS	Pearson correlation	0,438	
	P-Value	0,000	
GPA	Pearson correlation	0,362	0,319
	P-Value	0,000	0,000

Referring to Table 1 above shows P-Value shows the relationship between IL and moderately categorized SPS (0.438). the relationship between IL and GPA is moderate (0.362), and the relationship between intellectual skills and GPA with moderate category (0.319). Based on the results of multiple correlation analysis, there is a significant relationship between variable IL and SPS together with GPA. This based on the result of data analysis that shows, $F_{calculate}$ = 26,69 > 3,03 = F_{tabel} = (0,05;2;275) or in other words, data support to refuse H_0, with the level of trust 95%.

The fundamental issue is the development of the use of scholarly information owned by students to solve problems in everyday life and generate useful scientific resources (Fakhriyah, Masfuah, Roysa, Rusilowati, & Rahayu, 2017). Therefore, it affirms that the investigation is the ultimate goal of science education reform around the world (Adisendjaja, Rustaman, Redjeki, & Satori, 2017). This study examines the understanding of science teachers on skills research to develop their professionalism. However, it is important

to note that aspects of the nature of knowledge are not considered a comprehensive list, but rather a set of ideas that are important for students to learn about scientific knowledge (Lederman, Antink, & Bartos, 2014). In line with the description, the urgency of research in future science education, how to engage learners with science, scientists, and society to develop a sense of interest and desire with the world of science in to contribute to improving the quality of human life (Akpan, 2017)

Conclusion

This investigation concludes that there is a significant relationship between potential IL and SPS together with GPA. This is based on the result of data analysis that shows, $F_{calculate}$ = 26,69 > 3,03 = F_{tabel} = (0,05;2;275) or in other words data supports to refuse H_0, with a 95% confidence level. The recommendations are: (1) Learning cultures to improve literacy information need to be used as habituation to enhance the mastery of information technology. (2) Activities for science development need to developed through collaborative inquiry into the field of lecturer's submission (workgroup investigation).

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