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Self-Evaluation of Agro-Industry Prospective Teacher's Skill at Vocational High School in Information and Communication Technology Literacy

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ABSTRACT
Information and communication technology skill (ICT) in the millennium era be able to enhance teacher's professional competitiveness. Primarily, teachers be able to transfer important skills through ICT to students in high schools, especially in vocational schools. As a step toward realizing ICT literate teachers, the current research provides an overview of self-evaluation of prospective Agro-industry teachers to find out their ICT skills during college. The results were presented as a projection of the prospective teachers to use ICT in their classrooms when they become teachers. A total of $(n = 173)$ students from the first to fifth year were involved in the current research which then were analyzed in a simple quantitative to describe students' ICT skills. The results based on the average score of ICT skill showed that there is a tendency for second year students $(n = 36; \overline{X} = 3.07; SD\ 0.40)$ and third year students $(n = 38;\ \overline{X} = 3.17; SD = 0.37)$ to rate themselves good in ICT. They are currently active in the classroom lectures. Then, fisrt year students $(n = 38;\ \overline{X} = 2.80; SD = 0.36)$ tend to rate themselves lower in ICT because they are still in the adaptation phase from high school to college. Meanwhile, fourth year students $(n = 36;\ \overline{X} = 3.05; SD = 0.32)$ and fifth year students $(n = 25;\ \overline{X} = 3.05; SD = 0.44)$ tend to have decreased ICT skill due to less classroom activities, and focus on completing their final assignment as undergraduate students. We conclude that the prospective teachers in each college year have almost identical ICT skills based on the average score. According to this description, study program and faculty develop strategies and support facilities in order to maintain and even enhance the ICT skills of Agro-industry prospective teachers.

Keywords: self-evaluation, prospective teacher, vocational school, ICT literacy, Agro-industry.

INTRODUCTION

Digital technologies such as computer, telephone, and internet have been available and used in the school system (Adetimirin, 2012; Spiteri & Chang Rundgren, 2020; Starkey, 2020). This includes for teaching, managing digital learning environment, and becoming professional teachers (Hennessy et al., 2010; Starkey, 2020). Further, the presence of information and communication technology (ICT) can support and enhance previous learning, activate students' responses, provide new learning stimuli as well as systematic and stable feedback (Hennessy et al., 2010).

The diffusion of ICT in school systems is creating a real change in pedagogical approaches. There's a growing need for school systems to adopt innovative pedagogical strategies that accommodate different learning needs (Byungura et al., 2018; Hennessy et al., 2010). A research in foreign language teaching conducted by Sarıçoban is an example showing the use of computer as an effective tool for assessment, teaching grammar, vocabulary, syntax, reading comprehension, developing interactive communicative skill, and carrying out writing activities (Sarıçoban, 2013).

Unfortunately, previous research described the majority of students were not familiar with technology and have never been experienced e-learning so that their ICT skills were quite poor (Byungura et al., 2018). Moreover, the teachers early on indicated that they were not fully prepared to integrate technology effectively in their classroom due to a lack of access to ICT tools (Farjon et al., 2019). On the other hand, previous research suggests that pre-service teachers' attitude towards the use of ICT in the training process and their ICT competence for educational practice showing positive impact (Tondeur et al., 2018). It can be noted that the attitude and belief were the teachers' strongest factors to integrate ICT in the classroom (Farjon et al., 2019). Therefore, Tondeur et al believe that the prospective teachers who infuse ICT as their learning strategy will perceive higher competence in using ICT and strengthen their teaching practice (Tondeur et al., 2018).

According to previous study, the current research will describe the ICT skill of Agro-industry prospective teachers as an evaluation of their experience in using ICT to complete their courseworks or as a strategy to complete their study. Furthermore, the current research giving study program and faculty some insight on how to provide the best facilities for students in the future. In addition, this research describes students' ICT skill by their college year, from the first to fifth year students. It also used self-evaluation with 4 (four) Likert scales as a tool to determine the level of students' ICT skill.

METHOD

1 Participant

Research participants in the current study were Agro-industry prospective teachers for undergraduate level during 2019 college year (first year), 2018 college year (second year), 2017 college year (third year), 2016 college year (fourth year), and 2015 college year (fifth year) with a total of 305 respondents. The sampling technique used was propotionate stratified random sampling. The sampling results showed a total of 173 respondents/students with the number of students each college year consisting of 38 respondents (first year), 36 respondents (second year), 38 respondents (third year), 36 respondents (fourth year), and 25 respondents (fifth year).

2 Questionnaire Development

The first stage of developing questionnaire was collecting literature related to ICT literacy, there are 14 question items developed from thesis work (Al Hajar, 2020) for assess students ICT literacy within 5 aspects, including: 1) determining and accessing information (2 items); 2) evaluating information (3 items); 3) managing and integrating information (2 items); 4) generating information (6 items); dan 5) communicating information (1 item). The second stage was compiling questionnaire in matrix along with the description of abilities in Likert scale. There are 4 (four) point scales, point 1 (one) indicates very poor ICT skill and point 4 (four) indicates very good ICT skill. In the third stage, questionnaires were assessed by the experts in the fields of Communication Science, Library and Information Science, and Agro-industrial Technology Education who teach ICT-based courses in Universitas Pendidikan Indonesia. Lawshe's *content validity ratio* (CVR) was used to test the validity of the questionnaires. The results of the validity test to the experts showed a value of 0.76 (Al Hajar, 2020), it means more than 50% experts stated question items were relevant, and the instrument was valid (Lawshe, 1975). In the fourth stage, the questionnaire reliability test used Cronbach's Alpha which was tested on 30 respondents excluding the pre-determined sample (Ary et al., 2018). The results of reliability test showed a value of 0.82 (Al Hajar, 2020), and the instrument was reliable based on considered acceptable value 0.70 or higher (Ary et al., 2018).

3 Data Collection and Analysis

After the questionnaires valid and reliable, they were distributed to 173 respondents via online. The questionnaires were filled in by all respondents within one month of January – February 2020 (already starting the second semester for the freshmen/first year). Then, we made score interpretation using score interpretation formula (**Table 1**) based on the arrangement of psychological scale by Azwar. Furthermore, Azwar explained that the arrangement of the score interpretation involved calculating the theoretical average (μ) using **Equation 1** and ideal standard deviation (σ) using **Equation 2** (Azwar, 2012). The ideal number of standard

deviations is 6 (six) standards. Then, we created four categories of interpretation according to the number of Likert scale used in questionnaire. After we made score interpretation (**Table 2**) the data were analyzed descriptively by comparing the result of the average score ($\overline{X}$) with the score interpretation. In addition, the data was presented using a bar chart to determine patterns of the ICT skill based on self-evaluation of the Agro-industry prospective teachers by their respective college year. Data calculation and presentation also assisted by Microsoft Excel 2016.

Table 1 - Score Interpretation Formula

Category	Value Interval
Very Good	$\mu + 1.5\sigma \leq \overline{X}$
Good	$\mu \leq \overline{X} < \mu + 1.5\sigma$
Poor	$\mu - 1.5\sigma \leq \overline{X} < \mu$
Very poor	$\overline{X} < \mu - 1.5\sigma$

Source: Modification of Azwar (2012)

Theoretical average equation (μ)

$$\mu = \frac{1}{2}(\text{highest Likert scale} - \text{lowest Likert scale}) \quad \text{(Equation 1)}$$

Ideal standard deviation equation (σ)

$$\sigma = \frac{1}{6}(\text{highest Likert scale} - \text{lowest Likert scale}) \quad \text{(Equation 2)}$$

Table 2 - Score Interpretation

Category	Value Interval
Very Good	$3.25 \leq \overline{X} \leq 4.00$
Good	$2.50 \leq \overline{X} \leq 3.25$
Poor	$1.75 \leq \overline{X} \leq 2.50$
Very poor	$1.00 \leq \overline{X} \leq 1.75$

RESULTS AND DISCUSSION

The results showed that the Agro-industry prospective teachers' skill in ICT literacy based on the average score of self-evaluation indicated almost identical result in each college year (see **Table 3**). The first aspect related to determining and accessing information in which the students browse keywords to discover information sources via internet, and obtained the information used to support their coursework. Sophomores ($n = 36$; $\overline{X} = 3.32$) and juniors ($n = 38$; $\overline{X} = 3.28$) rated themselves very good at determining and accessing information (see **Figure 1**).

Table 3 - Average Score of Prospective Agro-Industry Teachers' ICT Literacy Each College Year

College Year	Average ($\overline{X}$) of ICT literacy	Standard Deviation (SD)	Category
2019 (first year)	2.80	±0.36	Good
2018 (second year)	3.07	±0.40	Good
2017 (third year)	3.17	±0.37	Good
2016 (fourth year)	3.05	±0.32	Good
2015 (fifth year)	3.05	±0.44	Good

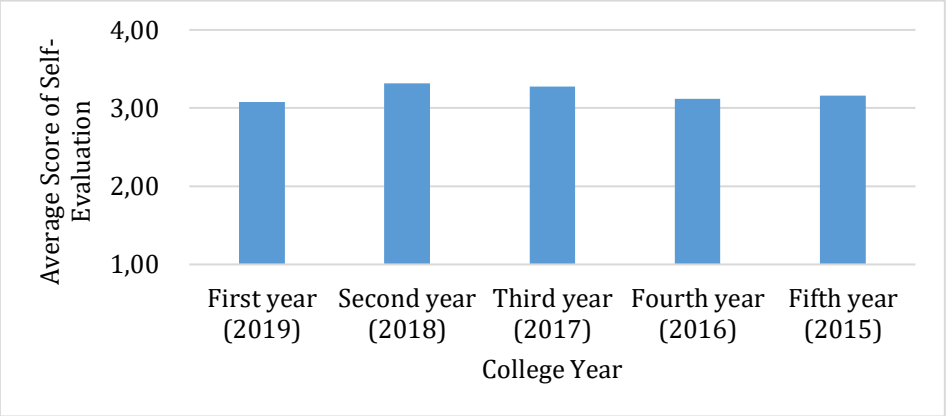

Fig. 1 - Aspect of Determining and Accessing Information

Second, students in each college year rated themselves good at evaluating information ($2.57 \leq \overline{X} \leq 2.83$). Based on the students' average score of each college year (see **Figure 2**), the first year students rated themselves very poor at evaluating information ($n = 38; \overline{X} = 2.57$). Aspect of evaluating information aims to assess the quality of the author, bias, and punctuality (latest information). The activities include selecting accurate and reliable sources, using latest information to complete their coursework, and comprehending the contents.

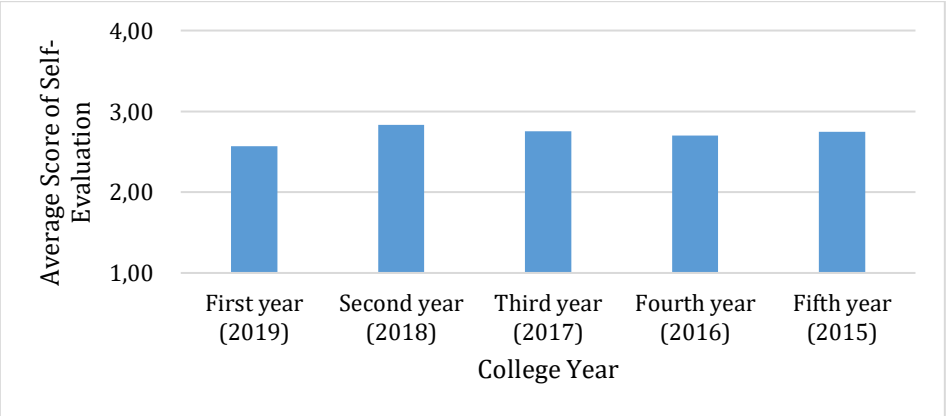

Fig. 2 - Aspect of Evaluating Information

Third, every student rated themselves good at managing and integrating information ($2.96 \leq \overline{X} \leq 3.14$). Based on the average score of each college year (see **Gambar 3**), the fifth year students ($n = 25; \overline{X} = 2.96$) rated themselves poor at managing and integrating information. The aspect of managing and integrating includes classifying and organizing information obtained using computer software. It is also done to interpret and represent the information that has been managed in other forms by summarizing, comparing, and contrasting the collected information from various sources.

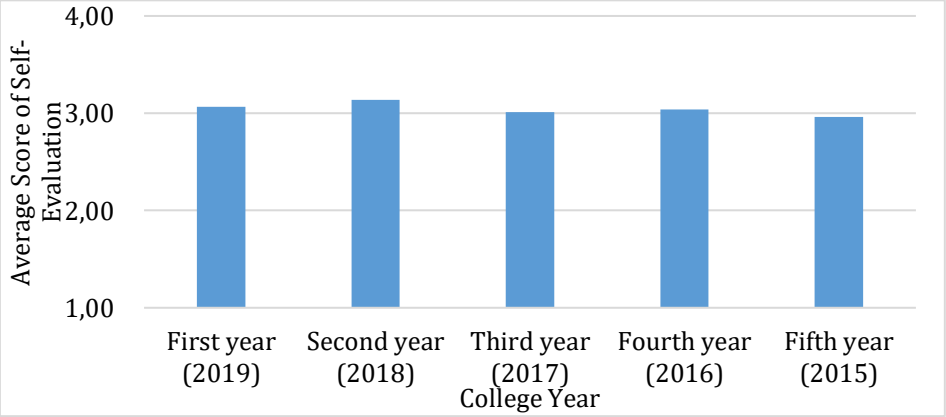

Fig. 3 - Aspect of Managing and Integrating Information

Fourth, the third year students ($n = 38; \overline{X} = 3.33$) rated themselves very good at generating information (see **Figure 4**). The aspect of generating information in digital environment includes adapting or designing information using various software such as making good and correct sentences, operating instructions from word processing software, presentation, and creating educational video.

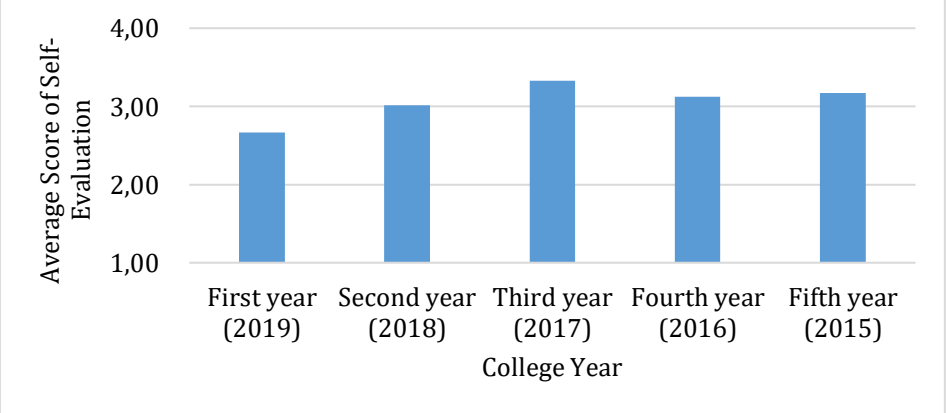

Fig. 4 - Aspect of Generating Information

Lastly, the first year students ($n = 38; \overline{X} = 3.21$) and the fifth year students ($n = 25; \overline{X} = 3.12$) rated themselves good at communicating information (see **Figure 5**). Meanwhile, the rests rated themselves very good at communicating information. The aspect of communicating information conducted to spread

relevant information to certain participants in an effective digital format. It includes-sending files digitally via Bluetooth, e-mail, social media, blog, and file sending application.

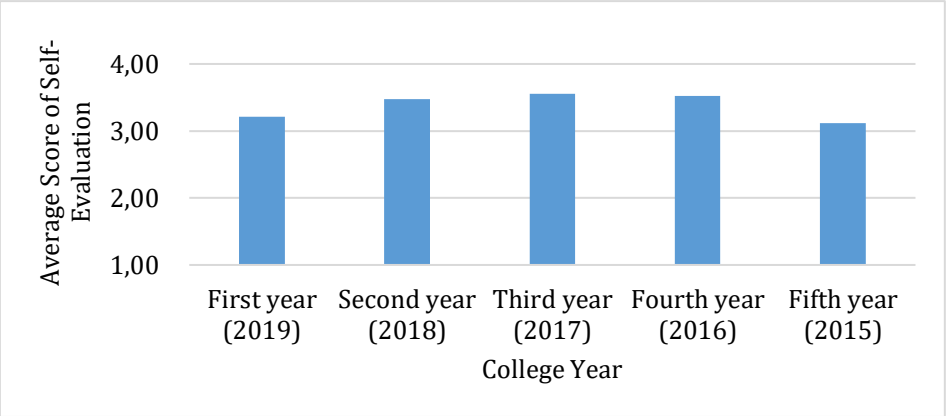

Fig. 5 - Aspect of Communicating Information

Based on the average score of self-evaluation on ICT skill, sophomores and juniors rated themselves very good at ICT. They are students in more active college years, both active in study and other college activities. This indicates that they use ICT more often to do their coursework and getting used to it (Adetimirin, 2012). They even have good self-confidence. It shows self-efficacy toward comprehending matters and their study achievement in which play a significant role for their ICT skill. (Hatlevik et al., 2018). Thus, they start to be more critical in using ICT which covers social, cultural, and educational aspects (Vourletsis & Politis, 2017).

Meanwhile, freshmen tend to rate their ICT skill poor due to the transition phase from high school to college. Freshmen still try to adapt the way they do coursework which are different from school assignments. Using ICT in the first college year seem stressful for them (Vourletsis & Politis, 2017). We assumed that the freshmen learn the new way of using ICT which is different from the common way they experienced during high school.

Furthermore, fourth and the fifth-year students rated themselves good at ICT. They have less learning activities in the class and more focus on completing their final project as undergraduate students. In contrast, the research conducted by Hatlevik et al (2018) showed that the longer they have experience in using ICT, the better ICT skill they gain to complete coursework and study period. So far, fourth and fifth-year students are still able to maintain their ICT skills in the good category. This certainly needs to be seen from the intensity of students in using ICT. The more frequent they use ICT, the better their ICT skills (Adetimirin, 2012). Hence, there are indications that they no longer frequently use digital devices that their ICT skills are starting to decline. This makes the prospective teachers unprepared to integrate technology effectively in the classroom when they become teachers (Byungura et al., 2018).

CONCLUSION

Based on the discussion, we conclude that the prospective teachers in those five college years have the same ICT skill by the average score of self-evaluation. As yet, their skills were categorized "Good". Second year and third year students tend to-rate themselves very good at determining and accessing information, managing and integrating information, generating information as well as communicating information. It is because they tend to be active in college. Meanwhile, first year students tend to rate themselves poor. We assumed that they are in the adaptation phase in using ICT from high school to higher education, especially in terms of doing their assignments. Fourth and fifth-year students' ICT skill tend to decline by examining the pattern of the previous average scores. It is because they focus on completing their final assignment as undergraduate students. Based on this description, study program and faculty can strengthen ICT literacy by providing adequate support for students. It can be demonstrated by introducing ICT-based courses (Israel, 2018), then providing sufficient learning sources, time and guidance (Adetimirin, 2012; Bozdogan & Özen, 2014; Hennessy et al., 2010). It is also by integrating ICT-based coursework. It is beneficial to have practical experience for students who will become teachers in terms of applying ICT in the classroom.

Lastly, the current research is limited by the process of collecting data based on self-evaluation and comparing the average score with the ideal score. However, this type of self-evaluation is necessary to develop as an enhancement of learning motivation, academic achievement, self-esteem, and the development of self-regulating learning (Papanthymou & Darra, 2018).

REFERENCES

Adetimirin, A. E. (2012). ICT literacy among undergraduates in Nigerian universities. *Education and Information Technologies*, *17*(4), 381–397. https://doi.org/10.1007/s10639-011-9163-y

Al Hajar, M. N. F. (2020). *Persepsi Mahasiswa Program Studi Pendidikan Teknologi Agroindustri terhadap Penguasaan Literasi Teknologi Informasi dan Komunikasi*. Universitas Pendidikan Indonesia.

Ary, D., Jacobs, L. C., & Sorensen, C. K. (2018). *Introduction to Research in Education*. Cengage Learning.

Azwar, S. (2012). *Penyusunan Skala Psikologi*. Pustaka Pelajar.

Bozdogan, D., & Özen, R. (2014). Use of ICT Technologies and Factors Affecting Pre-Service ELT Teachers' Perceived ICT Self-Efficacy. *Turkish Online Journal of Educational Technology-TOJET*, *13*(2), 186–196.

Byungura, J. C., Hansson, H., Muparasi, M., & Ruhinda, B. (2018). Familiarity with Technology among First-Year Students in Rwandan Tertiary Education. *Electronic Journal of E-Learning*, *16*(1), 30–45.

Farjon, D., Smits, A., & Voogt, J. (2019). Technology integration of pre-service teachers explained by attitudes and beliefs, competency, access, and experience. *Computers & Education*, *130*, 81–93. https://doi.org/10.1016/j.compedu.2018.11.010

Hatlevik, O. E., Throndsen, I., Loi, M., & Gudmundsdottir, G. B. (2018). Students' ICT self-efficacy and computer and information literacy: Determinants and relationships. *Computers & Education*, *118*, 107–119. https://doi.org/10.1016/j.compedu.2017.11.011

Hennessy, S., Harrison, D., & Wamakote, L. (2010). Teacher factors influencing classroom use of ICT in Sub-Saharan Africa. *Itupale Online Journal of African Studies*, *2*(1), 39–54.

Israel, O. (2018). An assessment of computer literacy among undergraduate students of Delta State University, Abraka. *Journal of Library & Information Science*, *8*(2).

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, *28*(4), 563–575.

Papanthymou, A., & Darra, M. (2018). The Contribution of Learner Self-Assessment for Improvement of Learning and Teaching Process: A Review. *Journal of Education and Learning*, *8*(1), 48. https://doi.org/10.5539/jel.v8n1p48

Sarıçoban, A. (2013). Pre-service ELT teachers' attitudes towards computer use: A Turkish survey. *Egitim Arastirmalari-Eurasian Journal of Educational Research*, *53*, 59–78.

Spiteri, M., & Chang Rundgren, S.-N. (2020). Literature Review on the Factors Affecting Primary Teachers' Use of Digital Technology. *Technology, Knowledge and Learning*, *25*(1), 115–128. https://doi.org/10.1007/s10758-018-9376-x

Starkey, L. (2020). A review of research exploring teacher preparation for the digital age. *Cambridge Journal of Education*, *50*(1), 37–56. https://doi.org/10.1080/0305764X.2019.1625867

Tondeur, J., Aesaert, K., Prestridge, S., & Consuegra, E. (2018). A multilevel analysis of what matters in the training of pre-service teacher's ICT competencies. *Computers & Education*, *122*, 32–42. https://doi.org/10.1016/j.compedu.2018.03.002

Vourletsis, I., & Politis, P. (2017). Differences in Attitudes Towards ICT in Education Between Freshmen and Senior Students of Department of Primary Education in Greece. In *Research on e-Learning and ICT in Education* (pp. 217–229). Springer International Publishing. https://doi.org/10.1007/978-3-319-34127-9_16