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The Influence Of Computational Thinking, Digital Literacy, And Self-Efficacy On The Use Of Moocs For Teachers

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Abstrak

Penggunaan media teknologi dalam dunia pendidikan sudah menjadi hal yang lumrah saat ini. Media teknologi yang digunakan dalam kegiatan pembelajaran tentunya memiliki berbagai manfaat. Penelitian ini dilakukan untuk mengetahui apakah teknologi media khususnya dalam penggunaan MOOCs memiliki hubungan dengan kemampuan berpikir komputasional, literasi digital, dan efikasi diri guru. Subyek penelitian adalah 99 orang guru yang aktif dalam komunitas Pengajar Belajar yang memiliki MOOC bernama "KELAS by Pengajar Belajar". Metode penelitian yang digunakan adalah penelitian kuantitatif. Teknik analisis data yang digunakan adalah uji Spearman's Rho dan regresi. Hasil penelitian menunjukkan bahwa keterampilan berpikir komputasional, literasi digital, dan efikasi diri guru berpengaruh terhadap penggunaan MOOCs.
Kata kunci: ***C****omputational Thinking, Digital Literacy, Self-Efficacy, Moocs*

Abstract

The use of technology media in the world of education has become a common thing at this time. Technological media used in learning activities of course have various benefits. This study was conducted to determine whether media technology, especially in the use of MOOCs, has a relationship with computational thinking skills, digital literacy, and teacher self-efficacy. The research subjects are 99 teachers who are active in a community, Pengajar Belajar, which has a MOOC called "KELAS by Pengajar Belajar". The research method used is quantitative research. The data analysis technique used is Spearman's Rho test and regression. The results of the study indicate that the skills of computational thinking, digital literacy, and self-efficacy in teachers have an influence on the use of MOOCs.
Keywords: *Computational Thinking, Digital Literacy, Self-Efficacy, Moocs*

INTRODUCTION

One of the things that humans require to survive is technology. Technology has made life easier for people and aided. Technology can benefit people not just in the professional, economic, and entertainment worlds, but also in the educational one. Since the COVID-19 Virus epidemic, technology has played a significant role in the modern world. Students have increasingly adopted online learning platforms, and almost all Indonesian schools now offer distance learning and education (Akuratiya & Meddage, 2020). The use of technology in the educational setting has a significance that is crucial to the learning process. Technology also plays a significant part in raising the caliber of teaching and learning activities. Technology benefits pupils by making it easier for them to comprehend particular ideas (Silahuddin, 2021).

Existing technological media must be selected (Hikmah, 2019) to ascertain whether the media is indeed useful and in accordance with the learning provided by the teaching staff in the classroom. The selection of technology media is necessary to ensure that the most appropriate media is selected for a particular educational or training purpose (Hashim, 2015). By using the right technology, it will motivate a student in the teaching and learning process (Raposo et al., 2020), build an active learning environment (Kazmi & Riaz, 2019), and help their understanding of the material being taught (Raja & Nagasubramani, 2018). Conversely, the use of inappropriate media will cause students to feel depressed (Toto, 2018) and can also make students misunderstand the subject matter provided, so they cannot achieve the desired learning outcomes. Therefore, teachers and students need to be provided with more technology training so that teachers are more comfortable in teaching and students become more independent (Carstens et al., 2021). Given that good teaching, teachers need an understanding of how technology relates to pedagogy and content (Gonçalves & Osório, 2018).

Massive Open Online Courses (MOOCs) are one sort of technology, media, or application that is in development. MOOCs are increasingly being used as a source of education today (Liu et al., 2019). There are numerous MOOCs examples from various countries that might be used (Hoy, 2014). These MOOCs provide a wide range of courses, including instruction on the development of character, self-skills, and knowledge in several fields, including science and computing. MOOCs are a useful tool for educating educators about the appropriate and safe use of ICT (Gordillo et al., 2019). A teacher's existing digital skills can be enhanced via MOOCs as well (Rivera & Ramirez, 2015).

People who do in this contemporary industrial environment need human resources with a positive self-efficacy mindset. According to a study, teachers who have a higher sense of self-efficacy are better able to adapt new pedagogical strategies, work with more pupils, and change curriculum or texts (Jacobs, 2020). Similar concepts apply to computational thinking (CT) and digital literacy. The computer and its software are examples of technology that can enhance attitudes and these two abilities. Students need to have certain fundamental abilities in CT to succeed in school. Researchers are now focusing on CT skills, and specialists in the field of educational technology have underlined that CT is crucial in terms of 21st century skills (Korkmaz & Bai, 2019). This CT skill has the same position as some other skills such as writing, numeracy, and counting (Zhong et al., 2016). CT skills are closely related to digital literacy (Maharani et al., 2020). With these two skills can help students to keep up with the development of technology that is currently popular and can also receive technology-based learning more easily.

The phenomena of the gap is that while using MOOCs demands certain abilities, many teachers who ought to have them are nonetheless unsure about how to use them for independent or asynchronous learning. Data from research by Gordillo et al. (2019) indicates that three courses are used: Course A is used by 66% of all instructors who can complete it, Course B is used by 89% of all teachers who can complete it, and Course C is used by 49% of all teachers who can complete MOOC learning. This is the rationale behind the question of whether a teacher's skills, particularly their CT skills, digital literacy, and self-efficacy, have any bearing on how they use MOOCs.

Many teachers have used MOOCs to improve their skills and knowledge and reuse them as teaching resources, but they still do not realize that using MOOCs also requires skills, such as CT skills, digital literacy, and self-efficacy.

This CT skill must be possessed by teachers, so that they can also teach it back to their students. Currently, students are required to be able to formulate a problem into a computational problem and be able to make a good computational solution (such as in the form of an algorithm) or explain the reasons for not finding a suitable and appropriate solution. The basis of cognitive abilities in CT is the

ability to reason, spatial ability, and problem-solving ability (Román-González et al., 2017). Digital literacy skills are also important skills that educators need to develop in their students beyond just encouraging the use of multiple media sources while at school (Statti & Torres, 2020). Self-efficacy is no less important for a teacher to have in teaching, teachers who have a high level of self-efficacy can overcome student difficulties (Malinauskas, 2017). Therefore, these three skills are needed by educators.

Not all teachers can use MOOCs well and can understand the content contained in MOOCs, so it is necessary to research whether there is an effect of CT skills, digital literacy and self-efficacy in using MOOCs, especially in learning computer science.

MOOCs, which stands for Massive Open Online Courses, are a group of online classes that share several key features, all content delivered online, whether through videos, slideshows, discussion forums, or a combination thereof (Hoy, 2014). MOOCs are commonly known as open educational programs broadcast online to thousands of students (Al-Matari et al., 2020). The term MOOCs was first demonstrated in 2008, an interactive online training course, by George Siemens and Stephen Downes, on "Connectivism and Connective Knowledge" (Pomerol et al., 2015). MOOCs have become an educational phenomenon and innovation that captures people's imaginations when using the Internet (Haber, 2014).

MOOCs are a type of web-based, open-access, asynchronous learning technology aimed at enrolling hundreds or thousands of students at once (Haron et al., 2019). MOOCs have become popular nowadays because many offer free training as well as training on today's technology (Laaser & Concha, 2018). These MOOCs are truly massive and open; anyone can apply, and there are no entry requirements, fees or other prerequisites and the MOOCs contains a wide variety of reading materials in multiple formats (Purkayastha & Sinha, 2021). MOOCs will have an important role in developing the skills of their users to support their career journey (Cinque, 2017). The advantages of using MOOCs as learning media are that they provide opportunities to provide better organization of the learning process and better content arrangement, are accessibility, and provide certification opportunities (Zakharova et al, 2019).

There are several characteristics of MOOCs (Galán et al., 2019): 1) Free access; 2) There is no limit to the number of participants; 3) There is no certification for free participants; 4) Audio-visual-based instructional design with written text support; 5) Student collaborative and participatory methodology with minimal intervention from teaching staff; 6) Educational resources that have certain similarities with the classroom, with the classroom; 7) With start and end date; 8) Have an evaluation mechanism; 9) Online.

CT is a thought process that is concerned with formulating problems and clarifying solutions so that computers, humans, or machines can function effectively (Wing, 2017). CT is an effective problem-solving model, but only one model. Others include scientific thinking or the scientific method and design thinking (Hunsaker, 2020). De Kereki & Manataki (2016), in their research used the Scratch application to gain a deep understanding of computer science concepts and to develop CT. They argue that this CT skill has an influence in using the Scratch application on MOOCs. Gao (2016) used an custom developed MOOC platform involving teachers and students, which was used to train CT. The results show that there is an effect of CT skills when using the MOOC. Toikkanen & Leinonen (2017) said that the MOOC project, however, is able to provide one possible design for advancing CT skills in schools. Samberg (2018) in his research said that there was a relationship between CT skills in using MOOC. Krugel and Hubwieser (2017) argue that CT skills are on the one hand intended to facilitate programming learning in interactive MOOCs.

Digital literacy is a person's ability to use digital technology, communication devices to find, evaluate, utilize, and produce information (UNESCO, 2018). Digital literacy is not only the ability to write and read but also includes the ability to understand and use information in various forms from a very wide variety of sources that are accessed through computer devices (Glister, 1997). Digital literacy has a considerable impact on the adoption and implementation of MOOCs in higher education institutions (AlQaidoom & Shah, 2019). Tobías-Martínez & Fuentes-Esparrell (2019) suggests that the development of digital literacy can use MOOCs. Rahmadi & Hayati (2020) suggest that there is a relationship between digital literacy and the use of MOOCs. Chatwattana (2021) conducted a study using MOOCs, the results showed that there was an effect of using MOOCs with digital literacy skills.

Self-efficacy is the extent to which individuals believe in their own abilities to successfully carry out tasks (Bandura, 1999). Self-efficacy makes a difference in how people feel, think and act (Schwarzer, 2014). Self-efficacy is a belief in one's ability to make the adjustments needed to achieve certain goals (Jacobs, 2020). The use of MOOCs is related to a learner's self-efficacy (Hodges, 2016). Padilla Rodriguez & Armellini (2017) conducted a study using the MOOCs Study Skill, the results showed the influence of self-efficacy skills. Research results from Ghazali et al. (2018) shows that there is a proven relationship between self-efficacy in the use of MOOCs. Lee et al. (2020) in his research used MOOCs with two different learning topics in it. There is relationship between self-efficacy and MOOCs use. Ghazali et al. (2021) knowing that there is a relationship between using MOOCs and self-efficacy, they developed a MOOC-efficacy scale.

The purpose of carrying out this research is as follows: 1) To analyze that CT skills affect the use of MOOCs; 2) To analyze that digital literacy skills affect the use of MOOCs; 3) To analyze that self-efficacy has an effect on the use of MOOCs.; 4) To analyze that CT skills, digital literacy, and self-efficacy affect the use of MOOCs. The researcher hopes that the results of this study can have a positive impact on the world of education, especially regarding the use of technology media in a school. This research is also expected to help educators in using MOOCs as a reference source for learning in schools, so that they are useful for their students in the classroom.

METHOD

The method used in this study is a quantitative research method, one of which is a survey method. The formulation of the problem used in this study is an associative problem. This study uses the form of a causal relationship, a causal relationship. So there are independent variables and dependent variables (Sugiyono, 2021).

The place of research will be in the Pengajar Belajar Community when online learning activities are asynchronous using MOOCs, “Kelas By Pengajar Belajar”, Pemrograman Dasar subjects. This asynchronous learning activity is carried out in March 2022. The subject of research will be conducted on teachers who join the community.

Researchers will identify and limit the problem, the next step to be taken is the formulation of the problem that leads to the preparation of hypotheses based on the existing theoretical basis. This hypothesis will then be proven empirically in the field. The researcher determines the number of samples from the existing population as a place for testing the hypothesis and also prepares the research instrument. The research instrument that will be used is a questionnaire. Questionnaire statements in quantitative research ask about the relationship between the variables that the researcher wants to know (Creswell & Creswell, 2018).

The data that has been collected is then analyzed. The analysis is directed to answer the problem formulation and test the proposed hypothesis. In data analysis using statistics in quantitative

research. The statistics used can be in the form of parametric and nonparametric statistics.

The analyzed data will be presented and discussed. Presentation of data can be in the form of tables and graphs. Discussion of the results of data analysis in the form of a rational explanation which can then be concluded. The conclusion contains answers and suggestions for each problem formulation from the data that has been obtained. The number of conclusions must be equal to the number of existing problem formulations. If there is a hypothesis that is not proven, it is necessary to give reasons.

Simple Random Sampling

The population and sample in this research were teachers who were involved in the Pengajar Belajar Community, as teachers who wanted to develop their skills in the field of technology. The sampling technique used in this study is simple random sampling. The number of samples taken is 99 teachers from the total population of 422 teachers who actively use the KELAS platform. This number of samples is suitable for research because it is in accordance with Yamane's formula (Sugiyono, 2021), as follows:

$$n = \frac{N}{1 + N(e)^2} = \frac{422}{1 + 422(0{,}1)(0{,}1)} = 80{,}84 \approx 81$$

Data collection technique

Researchers took primary data using a questionnaire technique with a closed statement model and through the internet. Questionnaires were distributed using the Google Form application and the time required for data collection was three weeks. The researcher used the SPSS version 26 to process and analyze the data in order to conclude that there is an influence of computational thinking skills, digital literacy and self-efficacy on the use of MOOCs.

This study used an instrument in the form of a questionnaire with a total of 153 statements, including 39 statements from the computational thinking skills variable, 29 statements from the digital literacy skills variable, 18 statements from the self-efficacy skills variable and 67 statements from the use skills variable. MOOCs. Each item statement uses a Likert scale. This scale is used to measure attitudes, opinions and perceptions of a person or group about social phenomena (Sugiyono, 2021). The statement is composed of five answer choices on an ordinal scale, namely: 1 (strongly disagree); 2 (disagree); 3 (neutral); 4 (agree); and 5 (strongly agree).

Data analysis technique

Researchers tested the hypothesis using the Spearman Rank correlation statistical technique, to determine the relationship between the dependent variable and each of the independent variables.

Regression analysis is used to obtain a functional relationship between two or more variables and to obtain the influence between variables (Usman & Akbar, 2020). The simple regression equation used in this study is as follows:

$$\check{Y} = a + bX$$

Researchers will also use ordinal logistic regression analysis techniques or also known as ordinal regression, to find out the relationship between the three independent variables together with the dependent variable. There are several stages of testing in this ordinal regression test, namely: the significance test of the model (Model Fitting Information) with the G statistic method, the goodness of fit test with the Deviance method and the coefficient of determination test (Pseudo R-Square) Mcfadden, Cox & Snell and Nagelkerke. The general model of logistic ordinal regression is as follows:

$$\log it\,(p1 + p2 + \cdots + pk) = \ln\left(\frac{p1 + p2 + \cdots + pk}{1 - p1 - p2 - \cdots - pk}\right) = \alpha_1 - \beta' X$$

RESULT AND DISCUSSION

First step, researchers test validity and reliability every statements. After that, data was analyzed by using Spearman test, simple regression test, and ordinal regression. Here are the results of the research that has been done.

Validity & Reliability Test

Researchers find the value of r by using Pearson to know the validity and reliability of each statement. For statements of CT skills, all of the statements are valid since the result of r more than 0.202, and the result of the calculation of the and reliability of computational thinking skills is 0.925 which it means all the statements of CT skills are reliable. This result is also shown in all statements of digital literacy and self-efficacy, all statements are valid, since it is more than 0.202. The results of the reliability tests are 0.958 and 0.957, respectively, it can be concluded that the results are perfectly reliable. The results of validity test on the use of MOOCs there are four invalid statements, number 101, 103, 125, and 127, so these statements are eliminated. For reliability test, the use of MOOCs is 0.985 which all statements are reliable.

Spearman Test and Simple Regression Test

Hypothesis testing using Spearman Rho test. If the value of the correlation coefficient (r) is equal to zero, it indicates that there is no linear relationship at all and when one variable changes, the others remain the same, meaning H_o is accepted (Field, 2018). The test results are also seen from the significance value, if it is less than 0.05 ($p < 0.05$), then H_o is rejected and if it is more than equal to 0.05 ($p \geq 0.05$), then H_0 is accepted (Morgan et al, 2020). Table 1 shows the results of Spearman's test using SPSS version 26. This test is to determine the relationship between computational thinking and the use of MOOCs.

Table I. Computational Thinking Correlation with the Use of MOOCs

Variable	Coef. Correlation (r)	Sig. (p)	Confidence Interval (0.95)
CT with the Use of MOOCs	0.567	0.000	Lower: 0.383
			Upper: 0.701

Table I shows a significance value (p) of 0.000 less than 0.05. The value of the correlation coefficient (r) is 0.567, which means the level of the relationship can be said to be moderate because it is in the range of 0.40 - 0.599 (Sugiyono, 2021). The resulting r value is positive, meaning it has a positive relationship. The confidence interval values shown are in the range of 0.383 - 0.701, which means there is only a 5% of chance that the actual population correlation coefficient between computational thinking and the use of MOOCs is less than 0.383 or more than 0.701. So the conclusion from the results of this test is that computational thinking has a relationship with the use of MOOCs.

The next step is a simple regression test to determine the effect of computational thinking skills on the use of MOOCs. The results of the regression test are in Table II as follows:

Table II. Simple Regression CT

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	0.927	0.566		1.637	0.105
CT Skill	0.776	0.134	0.505	5.769	0.000

The regression equation formed from the test results is as follows:

$$Y = 0{,}927 + 0{,}776X$$

From this equation, it can be interpreted that a constant of 0.927 states that if there is no value for computational thinking skills, the value of using MOOCs is 0.927. The X regression coefficient of 0.776 states that for every additional 1 value of computational thinking skills, the value of using MOOCs increases by 0.776.

The results of the regression test also show a t-count value of 5.769 and a significance value (p) of 0.000 less than 0.05 or equal to 0 then reject H_{01} and accept H_{a1}, which means that computational thinking skills have an influence on the use of MOOCs.

Table III. Digital Literacy Correlation with the Use of MOOCs

Variable	Coef. Correlation (r)	Sig. (p)	Confidence Interval (0.95)
Digital Literacy with the Use of MOOCs	0.736	0.000	Lower: 0.601
			Upper: 0.848

Table III shows a significance value (p) of 0.000 less than 0.05. The value of the correlation coefficient (r) is 0.736, which means the level of the relationship can be said to be strong because it is in the range of 0.60 - 0.799. The confidence interval value shown is in the range of 0.601 - 0.848, which means there is only a 5% chance that the actual population correlation coefficient between digital literacy and MOOCs use is less than 0.601 or more than 0.848. So the conclusion from the results of this test is that digital literacy has a strong relationship with the use of MOOCs.

The next step is a simple regression test to determine the effect of digital literacy skills on the use of MOOCs. The results of the regression test are in Table IV as follows:

Table IV. Simple Regression Digital Literacy

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	0.699	0.433		1.615	0.110
CT Skill	0.807	0.100	0.634	8.083	0.000

The regression equation formed from the test results is as follows:

$$Y = 0{,}699 + 0{,}807X$$

From this equation, it can be interpreted that a constant of 0.699 states that if there is no value for digital literacy skills, the value of using MOOCs is 0.699. The X regression coefficient of 0.807 states that for every additional 1 value of digital literacy skills, the value of using MOOCs increases by 0.807.

The results of the regression test also show a t-count value of 8.083 and a significance value (p) of 0.000 less than 0.05 or equal to 0 then reject H_{02} and accept H_{a2}, which means that digital literacy skills have an influence on the use of MOOCs.

Table V. Self-efficacy Correlation with the Use of MOOCs

Variable	Coef. Correlation (r)	Sig. (p)	Confidence Interval (0.95)
Digital Literacy with the Use of MOOCs	0.850	0.000	Lower: 0.751
			Upper: 0.910

Table V shows a significance value (p) of 0.000 less than 0.05. The value of the correlation coefficient (r) is 0.850, which means the level of the relationship can be said to be very strong because it is in the range of 0.80 - 1,000. The confidence interval value shown is in the range of 0.751 - 0.910, which means there is only a 5% chance that the actual population correlation coefficient between self-efficacy and MOOCs use is less than 0.751 or more than 0.910. So the conclusion from the results of this test is that self-efficacy has a very strong relationship with the use of MOOCs.

The next step is a simple regression test to determine the effect of self-efficacy skills on the use of MOOCs. The results of the regression test are in Table VI as follows:

Table VI. Simple Regression Self-efficacy

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	0.683	0.227		3.007	0.003
CT Skill	0.841	0.054	0.845	15.573	0.000

The regression equation formed from the test results is as follows:

$$Y = 0{,}683 + 0{,}841X$$

From this equation, it can be interpreted that a constant of 0.683 means that if there is no value for self-efficacy skills, the value of using MOOCs is 0.683. The X regression coefficient of 0.841 states that for every additional 1 value of self-efficacy skills, the value of using MOOCs increases by 0.841.

The results of the regression test also show a t-count value of 15.573 and a significance value (p) of 0.000 less than 0.05 or equal to 0 then reject H_{03} and accept H_{a3}, which means that self-efficacy skills have an influence on the use of MOOCs.

Ordinal Regression Test

The researchers took the first step to see the significance value generated by the Fitting Information Model test. Model Fitting Information explains whether by including independent variables in the model will contribute to the model, Chi-Square results in the relationship test depend

on the decrease in the value of -2LogLikehood for models that do not contain independent variables or only intercept and models that contain independent variables (Yamin and Kurniawan, 2014). The calculation results are attached in Table VII.

Table VII. Model Fitting Information Test

	-2 Log Likelihood	Chi-square	df	Sig.
Intercept Only	773.950			
Deviance	638.619	135.531	3	0.000

Table VII shows a significance value (p) of less than 0.05, meaning that the model is fit by entering the value of the independent variable, in other words, the next test step can be continued, calculating the deviance value. The goodness of fit test was conducted to see how well this ordinal regression model fits the observed data (Field, 2018). The results of the goodness of fit test can be seen in Table VIII.

Table VIII. Goodness of Fit Test

	Chi-square	df	Sig.
Pearson	4709.887	5887	1.000
Deviance	637.233	5887	1.000

A large chi-square value and a small p value (significance) indicate that the model does not fit the data well, a p value > 0.05 indicates the data really fits the model (George & Mallery, 2020). Yamin and Kurniawan (2014) also stated that the Goodness of Fit value > 0.05 (significant value of Pearson and Deviance > 0.05) then the model formed is fit or feasible to use.

From the calculation results in Table VIII, the Deviance value is 637.233 and the degree of freedom is 5887, so the value of $\chi_{(0.05,5887)}$ is 6066.61, meaning that the value of D < $\chi_{(0.05,5887)}$. The significance value (p) produced is 1,000 which means more than 0.05. So it can be concluded that the hypothesized model fits the data, so it can be continued with the next test.

The Pseudo R-Squared test consists of Cox and Snell, Nagelkerke, and McFadden. Pseudo R-Squared is used to explain the variation of the dependent variable that can be explained by the independent variable. The level of variability is indicated by the magnitude of the McFadden value (Ghozali, 2013). There are three Pseudo R^2 values which will be shown in Table IX, this Pseudo R^2 value is also known as the coefficient of determination. This value summarizes the proportion of variance in the dependent variable related to the independent variable (IBM, 2021).

Table IX. Pseudo R-Squared Test

Cox and Snell	0.745
Nagelkerke	0.745
McFadden	0.175

The coefficient of determination of Cox and Snell and Nagelkerke has a value ranging from 0 to 1. The coefficient of determination of Nagelkerke is obtained from the refinement of the coefficient of determination of Cox and Snell. Cox and Snell and Nagelkerke's coefficient of determination in Table

IX shows the same value of 0.745, meaning that the independent variables computational thinking, digital literacy and self-efficacy affect the use of MOOCs in general by 74.5% while 25.5% is influenced by other factors not included in the test. model.

The value of a good coefficient of determination according to McFadden (1977) is in the range of 0.2 to 0.4. Table IX shows the value of McFadden's coefficient of determination is 0.175, this value can be said to be good because if it is rounded up it becomes 0.2. From the result of Parameter Estimates at SPSS 26, we got this logistic ordinal equation as below:

$$\log it\,(p1 + p2 + \cdots + p67) = 26{,}915 + 0{,}210X1 - 1{,}071X2 - 4{,}404X3$$

From the test results, it can be said that hypothesis (H_{04}) is rejected, meaning that computational thinking, digital literacy and self-efficacy affect the use of MOOCs.

DISCUSSION

The results of the attached descriptive data analysis show the average value of each variable, the respondents agreed. Statements on computational thinking (CT) skills on average respondents answered "agree", when viewed from the histogram graph results show respondents' statements on average "agree" from all statements regarding CT skills. The same thing also happened to the statements on digital literacy skills and self-efficacy, the average results of the respondents also answered "agree" to each item of the statement, and when viewed from the histogram graph, the average respondents answered "agree" and "strongly agree". " The selection of this class is the reason why the researchers chose CT skills, whether the respondents already have CT skills in using this MOOCs.

A unique thing happened to the skill of using MOOCs, when viewed from the results of the histogram graph there were several respondents who answered "strongly disagree" and "disagree" on the overall statement on the skill of using MOOCs. From the respondents collected, it means that some are still not skilled at using MOOCs, is this influenced by the lack of clarity of instructions when using MOOCs and also the quality of MOOCs? The number of statement items on the skill of using MOOCs is indeed the most compared to other skill variables, is this also the cause of the respondents in responding to each statement. Researchers also estimate that this result may be due to the different backgrounds of respondents. However, there were some respondents who also stated “agree” and even “strongly agree”, this could happen because maybe some respondents were already used to using the MOOCs in learning about programming.

The relationship between computational thinking (CT) skills and the use of MOOCs has been discussed by de Kereki & Manataki (2016), in their research using the Scratch application in the “Code Yourself” MOOCs to develop CT skills. Gao (2016) also argues using an independently developed MOOC platform used to train CT. Toikkanen & Leinonen (2017) also argue that MOOC is able to advance CT skills in schools. Samberg (2018) also said that using MOOCs was very helpful for participants in increasing their understanding of CT. But the question is, do different MOOCs affect CT values? This study again proves that there is indeed a relationship between CT and the use of MOOCs although the relationship does not appear to be very strong, because there are still many influencing aspects. When viewed from the graph results of computational thinking skills and skills in using MOOCs, there are some respondents who still state "neutral" and even "disagree". This is probably due to the quality of the MOOCs itself.

Previous research on the relationship between digital literacy and the use of MOOCs, some

researchers suggest that using MOOCs can have a good impact on digital literacy skills. As did Chatwattana (2021), that digital literacy supports the use of MOOCs. This research that has been carried out also confirms that there is indeed an influence between digital literacy skills and the use of MOOCs, with the results of measuring indicators of digital media skills, information literacy and good communication possessed by each respondent. From the results of the histogram graph of digital literacy skills, it also shows that many respondents stated "agree" and "strongly agree", this indeed proves that digital literacy skills are important in using MOOCs.

The relationship between self-efficacy and the use of MOOCs in this study resulted in the strongest value. By using the MOOC-efficacy scale created by Ghazali et al. (2021), this study also applies this scale as an indicator of measuring self-efficacy skills possessed by each respondent. Padilla Rodriguez & Armellini (2017) also stated that there was a relationship between self-efficacy and the MOOCs they used in their research. The reason the researcher uses this scale is because they really want to know whether this scale is indeed suitable for the use of MOOCs, namely the KELAS platform? and indeed the results are as expected. The value shown, this self-efficacy skill has the strongest correlation value among other skill variables. So self-efficacy skills are really needed in using MOOCs for learning.

In addition, this study provides results that CT skills, digital literacy and self-efficacy simultaneously have an influence and are able to explain the skills of using MOOCs. However, there are other factors that have an influence or that can explain the skill of using this MOOCs, is it really necessary to collect meaningful scores?

Research Limitations

The process of conducting research starts from formulating problems, looking for theoretical foundations and formulating hypotheses. The next stage is making, developing and testing the instrument, then collecting data on the sample and analyzing the data that has been obtained. This is done in accordance with the suggestions put forward by Sugiyono (2021, 60) so that the research results are more accurate and useful. Of course, the quantitative research that has been carried out has shortcomings: 1) The number of samples is relatively limited as many as 99 respondents. The teachers who became respondents were only those who were active in the Teaching and Learning Community. So the results of this study cannot represent all teachers in Indonesia; 2) The question instrument has been tested for validity and reliability, but the instrument has not been said to cover all existing aspects, considering that from the calculation results obtained there are still around 25.5% of other factors that affect the use of this MOOCs; 3) Respondents who have filled out the instrument are said to be active in the Teaching and Learning Community and some have tried to use the KELAS platform, but errors and mistakes in filling out the instrument can still occur, considering that there are many aspects that are seen and asked in the research instrument.

CONCLUSION

The research that has been done can be concluded as follows: 1) Computational thinking skills have an influence on skills in using MOOCs, meaning that a teacher needs to have computational thinking skills in order to be able to use MOOCs and be able to understand the content contained in MOOCs.; 2) Digital literacy skills have an influence on skills in using MOOCs, meaning that a teacher needs to have digital literacy skills in order to be able to use MOOCs and understand content.; 3) Self-efficacy skills have an influence on skills in using MOOCs, meaning that a teacher needs to have self-efficacy skills in order to be able to use MOOCs so that they can complete courses in MOOCs; 4)

Computational thinking skills, digital literacy and self-efficacy simultaneously have an influence on skills in using MOOCs, meaning that these three skills are indeed needed by a teacher in using MOOCs.

Pedagogical Implications

In general, the teachers in the Learning Teaching Community have computational thinking, digital literacy, and self-efficacy skills and can use the MOOCs "Class by Teaching Learning". The difference in the level of these skills affects the use of MOOCs. This study aims to determine whether there is a relationship between computational thinking skills, digital literacy and self-efficacy on skills in using MOOCs.

This MOOCs provides several classes related to informatics. One of the classes used is the basic programming class. In following the basic programming class, one of the skills required, namely computational thinking skills. Through the findings of this study, computational thinking skills have an influence on the use of MOOCs. The value of the correlation coefficient that results shows the level of the relationship is moderate, computational thinking skills may not have a significant role in using other classes in MOOCs.

Digital literacy skills and self-efficacy also have an influence on skills using MOOCs. The results can be seen that the correlation coefficient value of digital literacy skills and self-efficacy skills shows the level of a strong relationship. Self-efficacy skills that have the strongest relationship in the use of MOOCs.

Therefore, it is necessary to train teachers first to improve self-efficacy and digital literacy skills so that users can take classes available in MOOCs well and achieve the learning objectives of each class.

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