

The Influence of Mastering The Information and Communication Technology (ICT) on Improving Teacher Performance at State Vocational Schools in Tegal Regency

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Abstract. Mastering the technology and information is the ability to understand in using the information technology tools, especially on computers. Expertising or mastering the use of information technology can be interpreted as a person's ability to operate it that supported by adequate intellectual abilities on both obtainable through independence study and educational and training ICT-based learning has many advantages, including more effective using of time, material lessons will become more accessible, interesting and students can develop the creativity in their own way, and students have more opportunities to explore them because they are motivated by the present of ICT in the learning process. The purpose of this study was to determine the influence on mastering the information and communication technology (ICT) in improving teacher's performance at State Vocational Schools in Tegal Regency. This study uses a quantitative approachment by collecting the data methods using a questionnaire (questionnaire). The research sample was Teachers of State Vocational Schools throughout Tegal Regency with a large sample of 167 teachers. The hypothesis test is using partial test or t-test. Based on the results of the t-test will show on the value of sig. of 0.000 < 0.05 so H_a is accepted and H_0 is rejected, it's concluded that there is an influence of ICT mastery on teacher performance

Keywords: ICT, Teacher Performance, Vocational High School

1. Introduction

The use of information and communication technology (ICT) has become an inseparable part of human life. Various aspects of human life have been influenced by the development of ICT, it's ranging from individuals to government and educational institutions. In addition, ICT can encourage changes in human civilization from the industrial era to the information age.

Information and Communication Technology (ICT) is all activities are related to processing, managing and delivering or transferring information between facilities/media. Information and communication technology combines electronic technologies and techniques that used to manage the information and knowledge, such as information handling tools use to produce, store, process, distribute, and exchange information.

The development of advances in Information and Communication Technology (ICT) today has had a major influence in all aspects of life, including the world of education. The development and the use of ICT in education can make the education system reforms better. Various extraordinary ICT capabilities should be utilized in the world of education in the

framework of giving birth to a better education system, both in terms of infrastructure and to increase the professionalism of the quality of human resources of educators (teachers) as well as producing the quality of students.

Problems that arise along with the use of ICT in the world of education are the factors on mastering the ICT by teachers as well as incomplete learning facilities and infrastructure. In the learning process, ICT is a tool that can help the task of teachers so that the teaching and learning process both inside and outside the classroom becomes better. Therefore, mastery of ICT by teachers is a must in order to improve teacher professionalism. Mastering of ICT among teachers, especially teachers who have been teaching for a long time (senior teachers) is a problem that must be found a solution. Therefore, teachers and other educators are required to be able to master information and communication technology because the use of technology and information can support the online and offline learning process.

Along with the development of technology from time to time, education is one part that is affected. Especially during the COVID-19 pandemic, which causes the learning process to become online learning. So like it or not, the learning process must be carried out by utilizing information and communication technology (ICT). Based on these problems, the researchers took the title: " The influence of mastering The information and communication technology (ICT) on improving teacher performance at State Vocational Schools in Tegal Regency ".

The information and communication technology in English is commonly referred to an information and communication technology (ICT). In general, information and communication technology can be interpreted as all technologies related to the retrieval, collection, processing, storage, dissemination, and presentation of information [1-4]. The information and communication technology includes two inseparable aspects, namely information technology and communication technology. It includes everything that related to the process, the tools and its manipulations in the management of information. While communication technology is related to the use the tools to process and transfer data from one device to another.

According to [5] defines that "information and communication technology (ICT) as a medium or a tool in obtaining knowledge from one person to another". Furthermore, the Ministry of Research and Technology states that information and communication technology (ICT) as part of science and technology is generally all technologies related to the retrieval, collection, processing, storage, dissemination and presentation of information. The information and communication technology is a combination of a set of technologies, especially computer microelectronics, communication technology that helps the process of collecting, storing, processing, delivering, and also presenting information data through various media including text, audio, video, graphics, and images [6-9]

Furthermore, according to [10] explains that "information and communication technology is a technology that is used to process, processing, obtaining, compiling, and manipulating data in various ways so that quality information is produced". The quality information is an information that is relevant, accurate, and timely. The information is used for personal and group purposes such as business, government, and organizations that are used for strategic steps in decision making. Based on some of the descriptions above, it can be concluded that Information and Communication Technology (ICT) is a technology used in the process of obtaining, compiling, storing, manipulating, and processing data or information in order to produce relevant, accurate, and timely data for individuals and groups. .

Meanwhile the mastering of technology and information is the ability to understand and use information technology tools, especially computers. Mastery or expertise is a synonym (synonym). which refers to a person's proficiency in a field. Expertise or mastery in the use of

information technology can be interpreted as a person's ability to operate it that supported by adequate intellectual abilities both obtained through innate talent and by learning [11]. The information technology itself according to [12] is "the facilities and infrastructure (hardware, software, useware) systems and methods for obtaining, transmitting, processing, interpreting, storing, organizing and using data meaningfully". Therefore, information technology provides many conveniences in managing information in terms of storing, retrieving and updating information. Furthermore, that mastery of technology and information is the skill that a person has towards the use of technology and information, especially devices on computers related to processing, packaging, and displaying data both in audio, visual, audiovisual, even multimedia.

The teachers must believe that ICT has a use in facilitating student learning processes and that ICT will not replace their position as a teacher, but help them to, at the very least, storing and presenting the concepts, principles and procedures they want to teach. The strategic effort that needs to be done is that teachers need to increase their confidence and be involved and participate in their development, namely the development of ICT for learning in order to improve the quality of the process and student learning outcomes.

Learning can be done anytime and anywhere. This encourages students to analyze and synthesize knowledge, explore, process and utilize information, produce their own writings, information and knowledge. Students are stimulated to explore science. Facilities that can be used by students to learn through E-Learning include: E-Books, E-Library, interaction with experts, email, mailing lists, News Groups, and others. Utilization of ICT in learning can be divided into two roles, namely: (1) as a learning presentation media, for example in the form of power point slides and animation with flash programs; (2) as an independent learning media or E-Learning, for example students are given the task of reading or searching for sources from the internet, sending answers to assignments, even trying and doing learning materials. Through E-Learning, learning is no longer limited by space and time[13].

Meanwhile, according to [14], the benefits of using ICT in order to support the implementation of learning are: 1) improving the quality of learning, 2) expanding access to education and learning, 3) helping visualize abstract ideas, 4) facilitating understanding of the material being studied, 5) displaying learning materials to be more interesting, and 6) enabling interaction between learning and the material being studied.

According to [1] that ICT-based learning will run effectively if it applies student-learned (student learned centered) learning, namely: 1) developing the ability of students to solve problems in real life (contextual), so that education becomes relevant and responsive to the demands of everyday life, 2) fostering reflective and creative thinking, 3) assisting the development and active involvement of students in the learning process.

The information and communication technology (ICT) provides opportunities for the development of creativity and independence of students. Learning by utilizing ICT services makes it possible to produce new works that are original, have high value, and can be developed further. Through ICT, students will get a variety of information in a broader and deeper scope so that they can increase their knowledge. This provides an opportunity to develop and utilize ICT in learning. According to [5] the use of ICT to support educational activities includes: (1) Obtaining various information from various sources of computer information with the internet as a result and application of ICT which has been widely used as a source of information that is easy, inexpensive, and fast to support education. (2) Disseminating of information Internet has been used to disseminate information to many people who can cover almost all areas around the world. Information can be accessed without being limited by distance, space, and time, can be anywhere and anytime. (3) Consulting

with tutors in distance education teaching learners are physically separated because there is no direct face to face, so the learning process is assisted by tutors. The internet can be used to consult with tutors who are in different places. For example, using e-mail services, chatting and mailing lists. (4) digitalling library (digital library); With this digital library, learners can access online sources of knowledge or information sources easily and quickly without being limited by distance and time. (5) Online learning is a learning process by utilizing computer and internet services. Using the internet allows teachers to give lessons and students receive presentations of these lessons without having to gather in one classroom. Online learning also allows students to exchange ideas, ask questions, or discuss with students, tutors, or with teachers. Online learning materials are made interactive, communicative, and interesting to improve the quality of learning, so that the results can be the same or even exceed the quality of learning that is carried out conventionally with face to face in class.

Based on the opinions of several experts above, it can be concluded that the use of ICT in education is an urgent demand in the current era of globalization. Therefore, it is necessary to use ICT to support educational activities. 21st century teachers are required to be creative and able to integrate the use of information technology, especially computers. Teachers must have an understanding that lessons in schools must be delivered as attractive as possible. For this reason, the presence of technology and information in the classroom is an obligation and need that must be mastered by the teacher. This is because 21st century students are those who are very familiar with computer- based multimedia or equipment.

To be able to use the information technology equipment in learning, teachers are required to have a standard of mastery of technology and information as described by [10] as follows: 1) Can operate and understand computers or laptops, 2) master various software such as Microsoft office or the like, 3) can operate a video camera, because bringing recordings or photos into the classroom can help students learn, 4) able to edit pictures or videos (can make simple films for learning purposes), 5) can make presentations and have expertise to give interesting presentations, 6) can write essays or simple stories, 7) familiar with social networking and the internet and 8) know the world of blogging or have their own blog.

The influence of technology and information as mentioned above for a teacher is very important and teachers are required to have standardization of competence in the learning process. According to [15], teacher competency standards in mastering technology and information, namely: 1) operating personal computers and peripherals 2) assembling, installing, setting-up, maintaining, and tracking, and solving problems (troubleshooting) on computers 3.) performing computer programming with one of the object- oriented programming languages 4) word processing with a personal computer 5) processing spreadsheets and graphics with a personal computer 6) managing data rank (database) with a personal computer or server computer 7) creating interactive presentations that meet the rules of visual and interpersonal communication.

The description of the indicators above can be concluded that the indicators of mastery of technology and information for professional teachers are teachers who act as useware or brainware for the use of information technology, especially computers related to mastery of computer hardware and software packages, which can produce a data or information that can then be stored, displayed or disseminated.

Along with the advancement of ICT, like it or not, teachers are required to master and utilize ICT in teaching their students. This level of mastery of ICT should be carried out gradually and continuously, either through independent efforts or through training organized by other competent institutions in the field of ICT for education and training.

Therefore, in addition to having the ability to teach in the classroom, teachers must also be able to integrate the use of ICT in learning. Teachers who integrate ICT in learning activities for their subjects at school will make learning activities more interesting and students more optimally understand learning materials and result in improving the quality of student learning outcomes. There are 4 levels of ICT competence possessed by teachers, namely: (1) mastering the basics of ICT (ICT Literacy); (2) deepening knowledge through ICT; (3) having the ability to create knowledge with ICT; and (4) sharing knowledge using ICT, both to students and other teachers [16]

So it can be concluded that teacher ICT competence is the ability of teachers to develop learning innovations by utilizing ICT both in planning, implementing, and evaluating learning, both in terms of pedagogical, personal, professional, and social competence aspects. ICT competence for teachers has at least two functions, namely ICT as self-development and ICT as a supporter of the learning process.

Marwan's research, in his thesis entitled "The Influence of the Use of Information Technology and School Organizational Culture on the Performance of Islamic Religious Education Teachers in High Schools in Palu City in 2017". The results of the research are : 1) The use of information technology has a significant effect on performance with a value of sig. $0.006 < 0.05$ and $t \text{ count } 3.122 > t \text{ table } 2.019$. 2) the implementation of organizational culture has a significant effect on teacher performance with a value of sig. $0.000 < t \text{ table } 2.019$. 3) The use of information technology and organizational culture simultaneously has a significant effect on teacher performance with a value of sig. $0.000 < f \text{ table } 3.22$. 4) Qualitative data on the use of information technology and teacher performance strengthens, deepens, and expands quantitative data. 5) Qualitative data on the implementation of organizational culture and teacher performance strengthen and deepen quantitative data. 6) Qualitative data on the effect of simultaneous use of information technology and implementation of organizational culture on the performance of Islamic religious education teachers strengthen quantitative data. 7) Other variables outside the research that affect the performance of Islamic religious education teachers are teacher discipline, teacher creativity, availability of facilities, and awards. The magnitude of the influence of the use of information technology and the implementation of organizational culture on teacher performance either partially or simultaneously is 40.5%, while the remaining 59.5% is influenced by other variables outside of this study.

2. Method

Researchers used a quantitative approach with data collection techniques using questionnaires that given to teachers at State Vocational High Schools throughout Tegal Regency. This research was conducted at 7 state vocational schools in Tegal Regency, namely: SMK Negeri 1 Adiwerna (140 teachers), SMK Negeri 2 Adiwerna (95 teachers), SMK Negeri 1 Dukuhturi (80 teachers), SMK Negeri 1 Slawi (89 teachers), SMK Negeri 2 Slawi (89 teachers), SMK Negeri 1 Bumijawa (80 teachers) and SMK Negeri 1 Warureja (88 teachers). So that the population of State Vocational High School teachers throughout Tegal Regency is 661 teachers.

In this study, the sample was taken using the proportional stratified random sampling technique. According to [17] what is meant by proportional stratified random sampling is "a sampling technique to obtain a representative sample, taking subjects from each stratum is determined to be balanced and proportional to the number of subjects in each stratum". Because the population is above 100 people, the sampling is 20% - 25% of the total population[17]. So the number of samples in this study were 167 teachers.

The research design used in this study is a survey type. According to [18] said that the survey was used to find out a general description of the characteristics of the population. In this, the authors conducted a survey using quantitative research with proportional random sampling technique. With simple linear regression analysis, it aims to examine the effect of variable X on variable Y. This analysis technique was chosen by the researchers because to determine: The effect of ICT mastery (X) on improving teacher performance (Y) in State Vocational Schools throughout Tegal Regency. The instruments of questionnaires in this study that will be used in the form of statements that describe the indicators of each research variable. The questionnaire are used to strengthen the data that has been obtained, especially regarding the response of educators (teachers) to the mastery of information and communication technology (ICT) and organizational culture to improve the performance of teachers in State Vocational Schools in Tegal Regency. The questionnaire used contains 60 questions, each variable is ICT mastery and teacher performance. To determine the validity of the instrument in this study using the product moment correlation with the deviation formula which is notated as follows :

$$r_{YX} = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{\left[N\Sigma X^2 - (\Sigma X)^2 \right] \left[N\Sigma Y^2 - (\Sigma Y)^2 \right]}}$$

With : r_{YX} = correlation of Y to X

While the reliability coefficient calculation technique used in this study is using the alpha- cronbach method. A set of questions in the questionnaire can be accepted if it has a reliability coefficient value greater than or equal to 0.7 [19].

To find out whether all independent variables simultaneously affect the dependent variable, as well as to test whether the regression model used is correct using the F statistic test. While testing the hypothesis in this study using a partial test or t test. The t-test is carried out by looking at the significance value, then compared with the value of $\alpha = 5\%$ (0.05) with the following decision-making provisions: (1) if the significant value is less than 0.05 then the hypothesis is accepted, meaning that the independent variable significantly affects the dependent variable , (2) if the significant value is more than 0.05 then the hypothesis is accepted, meaning that the independent variable significantly affects the dependent variable with a 95% confidence level ($\alpha = 5\%$).

3. Result & Discussion

The stages in the research are the first step the researcher conducts quantitative research by giving research permission to the head or principal of the school where the teachers work in State Vocational Schools throughout Tegal Regency, namely SMK Negeri 1 Adiwerna, SMK Negeri 2 Adiwerna, SMK Negeri 1 Dukuhturi, SMK Negeri 1 Slawi, SMK Negeri 2 Slawi, SMK Negeri 1 Bumijawa and SMK Negeri 1 Warureja. The next step is to distribute questionnaires or questionnaires to respondents, because the places or locations are far apart and there are a lot of respondents, namely 167 people, the questionnaire is given in the form of a google form. Then prepare the data that has been collected from the results of the questionnaire in the form of Microsoft Excel and perform quantitative data analysis with the

statistical tool SPSS 22.0. From the data analysis, findings are produced to answer the existing problem formulation and problem discussion.

The number of samples used in this study were 167 teachers with the distribution of respondents' characteristics as presented in the following table :

Table 1. Characteristics of Respondents

Characteristics	Total	Percentage
Gender		
Male	89	53%
Female	78	47%
Last education		
Sarjana (S1)	124	74%
Pasca Sarjana (S2)	43	26%
Doktor (S3)	0	0%
Years of service		
0-10 year	27	16%
11-20 year	58	35%
20-30 year	82	49%

The table above shows that the proportion of male respondents is 53% and female respondents are 47%. Respondents with the last education of S1 are 74% and S2 are 26%. Most of the respondents are respondents with a period of work in the range of 20-30 years with a proportion of 49%.

The validity test is carried out with the criteria that if the calculated r value $<$ r table value, it can be stated that the statement items used as research instruments are declared invalid or cannot be used as measuring instruments or research instruments. Meanwhile, if the value of r count $>$ the value of r table is valid as a measuring tool so that it can then be used in retrieval of research data. The results of the analysis of the validity test data from the 60 question items obtained the lowest calculated r value = 0.526 and the highest calculated r = 0.880, and the average r value = 0.749, while r table = 0.374. Because r arithmetic $>$ r table, it can be concluded that all research questionnaire questions are valid so that they can be used in collecting research data.

The method is used to test the reliability or reliability is the alpha-cronbach method. A construct is said to be reliable if it gives a Cronbach alpha value $>$ 0.700 (Ghozali, 2016). The results of reliability testing can be seen in the following table:

Table 2. Research Variable Reliability Test

Research variable	Cronbach Alpha	Reliable Minimum Limit	Information
Mastery ICT (X)	0.969	0.700	Reliable

Teacher Performance (Y)	0.983	0.700	Reliable
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From table 2 above, the results of reliability testing show that the value of Cronbach's alpha for all research variables is greater than the minimum limit value of 0.700 so it can be stated that the measuring instrument for each variable is reliable. After testing the research instrument, then testing the hypothesis as presented as follows:

3.1 Partial test or t test

Hypothesis testing using the partial test method or t-test is carried out using the criteria if the t-count value > the t-table value is 1.974 (0.05; 167) then the proposed research hypothesis is accepted, otherwise if the t-count value < t-table value then the research hypothesis is declared rejected. The results of hypothesis testing with the t-test method are presented in the following table :

Table 3. Test Results t-test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	18,653	3,855		4,838	0,000
1 mastery ICT	,261	,045	0,344	5,848	0,000

Based on table 3 above, it is concluded that: the standard coefficient value on the ICT mastery variable is known to be 0.344 with a t count of 5.848 which means the t count > t table so that the proposed research hypothesis, namely that there is an influence of the ICT mastery variable on teacher performance, is declared accepted. A significance value of

0.000 indicates that the influence of the ICT mastery variable has a significant effect on the significance level or confidence level of 95% with a degree of error of 0.05 or 5%.

3.2 F test

Hypothesis testing using the F-test method is carried out using the criteria if the F count value > F table value of 3.050 (0.05; 167) then the proposed research hypothesis is accepted, on the contrary if the F count value < F table value, the research hypothesis is declared rejected. The results of hypothesis testing with the F-test method are presented in the following table :

Table 4. Test result F-test

Table 4. Test result F-test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	5441,778	2	2720,889	92,591	0.000
1 Residual	4819,300	164	29,386		
Total	10261,078	166			

Based on table 4 above, it is known that the F count coefficient value is known to be 92.591, which means the F count value > F table so that it can be stated that teacher achievement is influenced by the independent variable of ICT mastery. The significance value of 0.000 indicates that the influence of the ICT ruler variable and organizational culture has a significant effect on the significance level or confidence level of 95% with a degree of error of 0.05 or 5%.

c. Coefficient of Determination Test

Testing the coefficient of determination is carried out to determine the extent to which ICT mastery and organizational culture are able to explain teacher performance with the criteria that if the adjusted R square value is more than 0 and approaches 1 then the proposed research model is a good model. The results of testing the coefficient of determination are as presented in the following table :

Tabel 5. Coefficient of Determination Test Results (R²)

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.728 _a	.530	.525		5,421

Based on table 5 above, it is known that the adjusted R square value is 0.525 or 52.5%, which means that the performance of State Vocational School teachers in Tegal Regency can be explained by the ICT mastery variable of 52.5%, while the remaining 47.5% is explained by other variables besides the independent variables studied in the study.

Discussion

The findings in this study indicate that there is an influence of mastery of information and communication technology (ICT) on improving teacher performance in State Vocational Schools throughout Tegal Regency, as evidenced by the arithmetic value on the partial test or t-test with a t count of 5.848 which is greater than a t table of 1.974. Because the value of t arithmetic is greater than t table, it can be concluded that the proposed research hypothesis has a positive influence between the variables of mastery of communication information technology (ICT) on the teacher performance variable in State Vocational Schools throughout Tegal Regency.

The mastery of Information and Communication Technology (ICT) is the ability to understand and use information technology tools, especially computers. Expertising or mastering in the use of information technology can be interpreted as a person's ability to operate it, supported by adequate intellectual abilities, either obtained through independent study or through education and training.

To be able to use information technology equipment in learning, teachers are required to have a standard of mastery of technology and information, including: the ability to operate and understand computers or laptops, master various software such as Microsoft office or the similarity that can operate video cameras, because they bring recordings or photos to the

computer. in the classroom it can help students learning, able to edit pictures or videos (can make simple films for learning purposes), to present and have the expertise to give interesting presentations, able to write simple essays or stories, familiar with social networking and the internet and get to know the world blogging or have your own blog. Mastering of ICT can lead to an increase in teacher performance which is invested in the learning process of students so that learning outcomes can be maximized.

Research according to Utari (2016) at SMK 2 Sewon and Faisal Nur Iman (2015) at SMP Negeri 1 Ungaran showed that ICT mastery had an effect on teacher performance. Thus, the results of this study support previous research.

4. Conclusion

Based on the results of the research that has been done, it can be concluded that there is a significant influence on the mastery of Information and Communication Technology (ICT) on teacher performance, this is shown by the t-count value of 5.848, which is greater than the t-table of 1.974. Because the t-count value is greater than t-table, it can be concluded that there is an influence of the ICT mastery variable on teacher performance.

Mastering the technology and information is the ability to understand and use information technology tools, especially computers. Expertise or mastery in the use of information technology can be interpreted as a person's ability to operate it, supported by adequate intellectual abilities, either obtained through independent study or through education and training. The information and communication technology (ICT)-based learning has many advantages, including the use of time used to be more effective, subject matter materials to be more accessible, attractive, and inexpensive. In addition, students can develop creativity in their own way, and students have more opportunities to explore because they are motivated by the presence of ICT in the learning process

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