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Effects Use of Information And Technology Learning Communication Toward Students 'Achievement Knowledge Science in Vocational Schools Jakarta

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Abstract:
This study aims to determine: 1) teachers 'perceptions about the use of ICT, 2) the ability of lecturers to develop ICT, and 3) The effect of lecturers' perceptions about the use of ICT and the ability of lecturers to develop ICT-based learning on student learning. Achievements in science subjects in vocational high schools in Jakarta. This research uses a quantitative approach with a survey method and is carried out in vocational high schools. The population of this study was 290 Senior High School Teachers. Determination of the sample is done by simple random sampling technique. The collection of data in this study uses questionnaires and documents on student learning outcomes. Research data were analyzed using descriptive and inferential statistics. This study concluded that: 1) There was an effect of teacher perceptions about the use of ICT on students' learning achievement in science subject, 3) There was an effect of teacher's abilities develops ICT-based learning on student's learning achievement in science subject, and 3) there was a joint effect of teachers' perceptions about the use of ICT, the ability of teachers to develop ICTs for learning on student's learning achievement in science subject. Based on the results of this study, it is recommended that to improve students 'ICT learning outcomes should be improved through teacher perceptions about the use of ICT, the ability of teachers to develop ICTs for learning

Keywords: ICT-Based Learning, Perception On ICT, Learning Achievement

INTRODUCTION

Technology is an integral and inseparable part of the life of modern society. Toffler (1980) described the development as a revolution that took place in three waves. The first wave

in the form of agricultural technology that has lasted thousands of years until now, the second wave is marked by the presence of industrial technology, and the third wave is a revolution of electronic and information technology, which lasted only in decades.

Some developed countries in the world place information and communication technology as an important element in the education system to increase the effectiveness of learning, help deepen students' knowledge, involve them in building their own knowledge, support the development of complex thinking skills.

According to Alessi and Trollip (2011: 3) learning based on information and communication technology has many advantages, including those advantages in the use of time used to be more effective, subject matter materials become more accessible, interesting, and inexpensive. Similiar opinion was expressed by Jonassen, Carr and Yueh (1998) that computer technology not only supports learning by trying to instruct students, but also can be used as a tool to construct student knowledge. In this case, students are positioned as designers, and computer functions as mindtools to interpret and organize their knowledge.

Ronau, Rakes, and Niess (2011) explain that improving teacher understanding and experience in the use of information and communication technology can avoid the gap of interaction between teacher and students, the effect is to improve the learning process, assessment, and instructional practices in general. Studies conducted by Zhao and Frank such as quoted by Molenda (2008) that the use of ICT in learning, among others, by teachers in preparation for learning 58%, communication between teachers and teachers with students 37%, recorded 29%, 30% remedial learning, student investigations 14%, curriculum 41%, classroom management, including computer access 38%. This shows that the use of information and communication technology is so important, both by students, teachers and by educational institutions.

The successful use of information and communication technology in learning depends on the extent to which the teacher understands how to implement technology in the classroom, besides the pedagogical understanding of the use of ICT is also a measure for a teacher in viewing the planned learning. And no less important is the existence of competency standards for teachers in implementing integrated ICT learning. This is important because the guidance of teachers who have good competence will enable students to learn more effectively with ICT assistance.

Learning is an activity that is designed and aimed at gaining new experiences. While learning activities that occur unintentionally are mental or psychological activities that take place in active interactions with the environment, resulting in changes in knowledge and understanding of skills and the value of attitudes that change is constant and trace (Callahan and Cark, 1983). The same thing was stated by Bower and Hilgard (1981) that learning is interpreted as a change in behavior that is relatively permanent and is not caused by a process of maturity. Kimble & Garmezy cited by Sims & Sims (2009) defines learning as a relatively permanent change in attitude or behavior that occurs as a result of repeated experience. These opinions suggest that learning is basically a term used to describe the process of change through experience. The process of change includes understanding, attitudes, knowledge, information, abilities and skills that are relatively permanent through experience. Behavior change must be measurable to ensure behavior change.

The learning process will result in changes in behavior. Gagne et. al. (1977) explains that learning outcomes are the results of the learning process achieved by the learner in mastering the material that has been taught. Furthermore, Gagne explained that in general the learning outcomes could be identified in several expected categories. The intended learning outcomes categories include: Intellectual skills, cognitive strategies, verbal information, motor skills and attitudes. To find out the level of achievement of student learning outcomes, teachers use learning outcomes tests. Learning outcomes are usually expressed in terms of scores

obtained by students after taking a test of learning outcomes held after the completion of a teaching program.

As the spearhead in learning activities, participant learning outcomes are strongly influenced by the effectiveness of teachers in utilizing models and media in delivering learning material. Teachers' perception of the benefits of ICT is what underlies them in using it to improve student learning outcomes. According to (Flavell, 1985) and (Pastorino and Portillo, 2013), perception is the process by which a person gets direct information about the world around us, perception occurs when someone interprets the meaning of information collected through his senses. This understanding has the meaning of the events that occur in one's environment. Meanwhile Schiffman, as quoted by George and Jones (2002), states that perception is "the process by which individuals select, organize and interpret the input from their senses." This definition shows that perception is the process by which individuals choose, organize, and interpret input from their senses. Likewise with Gredler (2011) which suggests that perception is the process of choosing and recognizing physical signals that stimulate the senses. Furthermore Champoux (2006) states that perception is a cognitive process that lets a person feel the urge from the environment. The effect of the urge can be felt in the form of vision, touch, pleasure, smell and hearing. The impulse can come from other people, events, physical objects and ideas.

Hennessey, Deaney, and Ruthven as quoted by Cowie and Jones (2009) suggest that many teachers and schools are aware that utilizing information and communication technology can increase the effectiveness of learning in class and administrative and management activities. It was further stated that information and communication technology can also be used as a communication tool, access to various resources such as the internet, and as a forum for collaborative activities involving teachers, students and the wider community. Technology is only a tool for designing learning. Teacher creativity is the key in integrating technology into learning. For this purpose, the teacher must first understand what technology can do to improve learning.

According to Li Wang (2005) there are 5 benefits of ICT applications in helping learning: (1) helping students to be involved in writing, planning writing, composing, revising, editing, storing, printing, making tables and graphics, and printing; (2) electronic books can enrich student learning resources, although it is known that they will never completely replace traditional books, by utilizing the internet which is usually equipped with "multimedia content" will be able to motivate students to read; (3) assisting students in actualizing themselves when they are involved in authentic assignments, with computer technology student work easily published in various ways, such as in newsletters, brochures, Web pages, CD-ROMs, etc .; (4) students can build partnerships by communicating through the internet; (5) students can search for learning materials online, with Web pages for example, databases, online journals, news, teaching materials.

By utilizing the development of information and communication technology, education can reach all levels of society who live in various places, in cities, villages, even in remote or remote areas, so that the efforts to equalize education can be carried out. Application of information and communication technology which is a technological development, including computer media. The computer is an application of information and communication-based technology that is used as the main device to process data into useful information by processing, presenting, and managing information.

Based on the background of the research, this study aims to find out: 1) teachers 'perceptions about the use of ICT, 2) Teachers 'ability to develop ICTs, and 3) Effects of teacher perceptions about the use of ICT and teacher’s abilities develops ICT-based learning on student’s learning achievement in science subject in senior high school.

METHOD

This research is a positivistic or quantitative study and uses a survey method with a descriptive statistical approach. The population of this research is 290 teachers of from State Senior High Schools in ..... City. Sample was taket by simple random sampling technique. The data collection in this study uses a research instrument in the form of an instrument of teacher perception about the use of ICT in learning, an instrument of teacher's ability to develop ICT-based learning. Student learning achievement in science subject was taken from the data of student learning achievement. Research data were analyzed using descriptive and inferential statistics.

RESULTS AND DISCUSSION

Teacher perception scores about the use of ICT was obtained from respondents had an average of 65.72, with a standard deviation of 3.157, a median of 66, a minimum score of 59, and a maximum score of 73. From the description it can also be seen that between the average scores and and the median is almost the same, which is 65.82 and 66. This shows that the teacher's perception score data on the use of ICT in this study is quite representative. Whereas scores above the average are more than those below the average, it indicates that students who have more teacher perceptions about the use of ICTs are higher than those that are low.

The ability of teachers to develop learning scores obtained from the respondents has an average of 72.27 with a standard deviation of 10.259, a median of 71, a minimum score of 50 and a maximum score of 97. From the description it is also known that between the mean and and the mean (median)) is almost the same, namely 72.27 and 71. This shows that the data on the ability of teachers to develop learning obtained in this study is quite representative. While the scores that are above the average are more than those below the average, it indicates that students who have the ability of the teacher to develop more learning than the negative.

Students' science subject learning achievement data obtained from respondents had an average of 64.15 with a standard deviation of 3.908 medians of 64, a minimum score of 56 and a maximum score of 75. This shows that the average of repondents' science subject learning achievement were high. The standard deviation score of 3.99, shows the differences in answers among respondents, including high. This shows that the students science subject learning achievement are quite diverse.

The results of the linearity test calculation of the regression line of the relationship between ICT use variables and students' science subject learning achievement show a significance value of 0.541 for all samples, higher than 0.05. In other words, that the regression line is the relationship between the X1 variable and the Y variable is linear. Furthermore, the results of hypothesis testing are shown in table 1.

Table 1: Analysis of variance effect of teachers' perceptions about the use of ICT on students' students science subject learning achievement

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	474.263	1	474.263	41.669	,000[a]
Residual	1343.037	118	11.382		
Total	1817.300	119			

a. Predictors: (Constant), Teachers'_Perception

b. Dependent Variable: Students'_Learning_Achievement

Table 1 shows that Sig = 0.000 and Fcount = 41.666, while Ftable = 3.07. Because the Sig value <0.05 and $F_{count} > F_{table}$, H0 is rejected which means that there is a significant influence of the independent variable Xi (teacher's perception of the use of ICT) on the dependent variable Y (students' science subject learning achievement).

The results of the calculation of the linearity regression line relationship between The ability of teachers to develop ICTs for learning on students' science subject learning achievement shows a significance value of 0.139 for all samples, higher than 0.05. In other words that the regression line is the relationship between the X2 variable and the Y variable is linear. Furthermore, the results of hypothesis testing are shown in table 2.

Table 2: Analysis of variance effect of teachers' ability to develop ICTs for learning on students' science subject learning.

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	59.213	1	59.213	3.974	.049[a]
Residual	1758.087	118	14.899		
Total	1817.300	119			

c. Predictors: (Constant), Teachers'_Ability

d. Dependent Variable: Students'_Learning_Achievement

Hypothesis testing obtained that the value of Sig = 0.049 and Fcount = 3.974, while Ftable = 3.07. Because the value of Sig <0.05 and $F_{count} > F_{table}$, H0 is rejected which means that there is a significant influence on the independent variable X2 (teacher's ability to develop ICTs for learning) on the dependent variable Y (students' science subject learning achievement).

Table 4. Analysis of variance joint effect of teacher perceptions about the use of ICT and teachers' ability to develop ICTs for learning together on students' science subject learning.

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	506.011	2	168.670	14.921	,000[a]
Residual	1311.289	116	11.304		
Total	1817.300	119			

e. Predictors: (Constant), Teachers'_Perception, Teachers'_Ability

f. Dependent Variable: Students'_Learning_Achievement

From the significance test of the regression coefficient which is also carried out with the SPSS program it is found that the regression coefficient is significant, which is indicated by the value of Sig = 0,000 and F_{count} = 14,921, while F_{table} = 3.07 so that the values of Sig <0.05 and Fcount> Ftable or the regression significant, which means that there was a positive effect on the independent variable X1 (teacher's perception of the use of ICT) and X2 (teacher's ability to develop ICTs for learning).

Perception is how individuals judge and give opinions about what is seen and felt about an event that is felt through the senses. Thus the teacher's perception is the ability of a teacher to assess and give opinions about what is seen and felt through his personal experience. Teachers are not the only source of information done by lecturing in delivering subject matter. Teachers not only transfer knowledge, but can also learn from their students. The teachers are not the instructor who gives orders or directs it to students but as learning partners so it allows students not to hesitate to express opinions, ask questions, exchange ideas with the teachers.

Utilization of ICT in learning continues to get positive responses from teachers. The teacher's role in utilizing ICT in learning not only provides knowledge, but also fosters critical thinking skills, increases information literacy, accustoms collaborative learning and prepares students for new experiences. Besides that the teacher must choose the right method to meet the learning needs of students, and according to their level of thinking. The benefits of ICT can also be done to facilitate internet access, virtual laboratories and others. For this reason, teachers are required to be able to theoretically and practice communicating with ICT in learning.

CONCLUSION

This study concluded that: 1) There was an effect of teacher perceptions about the use of ICT on students' science subject learning achievement, 2) there was an effect of teacher's ability to develop ICTs for learning on students' science subject learning achievement and 4) there was a joint effect the teacher's perception of the use of ICT and the ability of teachers to develop ICTs for learning on students' science subject learning achievement. Based on the results of this study, it is recommended that to improve students' science subject learning achievement should be improved through teacher perceptions about the use of ICT and the ability of teachers to develop ICTs for learning.

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