

The Effect of the Science and Technology Development on the Students' Learning Achievement of Grade XI Students at SMK Teladan Pematangsiantar

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Abstract—This study aims to determine the influence of the development of science and technology on the students' achievement of grade XI at SMK TELADAN Pematangsiantar. This research was conducted at SMK TELADAN Pematangsiantar, the population is all the students of class XI as many as 83 students. The instrument used to measure the variable X was in the form of a questionnaire, while to measure the variable Y, it was seen from the school documentation in the form of a list of scores in odd semester. The Data analysis techniques used to determine the relationship between variable X and variable Y are Product Moment Correlations. From these calculations, the results obtained r count = 0.618 means the influence of the development of science and technology (variable X) on student achievement (variable Y) is categorized as strong. To test the hypothesis the t -test is used. From the calculations, it was obtained; t -count 7.07 which is then compared with t -table at the significant level of 95% or alpha 5% and degrees of freedom ($df = n - 2$, $83 - 2 = 81$) with a value of t -count > t -table or $7.07 > 1.67$ Thus the hypothesis is accepted, namely: There is a significant effect between the development of science and technology on students' learning achievement of class XI at SMK Teladan Pematangsiantar.

Keywords— science and technology development, students' achievement.

I. INTRODUCTION

In this modern era, the technological revolution looks very striking in two ways, namely the field of information and communication. Both of them experienced an escalation of transformation so powerful that it might never have been imagined before. Both of them have penetrated so deep down to the smallest realms of human life, without any other force capable of blocking it. This is all driven by the determination of global power which is extremely powerful and at this critical point, the world of education must be able to respond dynamically, creatively, and productively.

We live in an age of information openness and freedom of communication. This is an era in which information can be accessed by anyone, at any time, and without limits, from and all over the world. In this critical era, educational institutions cannot just close themselves off from developments in the outside world.

In fact, educational institutions must be proactive in developing aspects of information and communication technology, so that ICT can be used to support the effectiveness of the current education program.

"The application of information and communication technology to education is a real and factual challenge. This big role is the responsibility of the world of education" A. Malik Fadjar (1999: 157), theoretically and empirically, education is recognized as an institutional force for a nation in achieving progress. Moreover, in the era of globalization which is full of

economic competition, civilization, and technology as it is today, there is no other way for us except to appear as dynamists and creators, in driving progress and enlightenment on all elements of the nation through the world of education. Teachers are required not only to utilize existing learning resources at school (let alone only read textbooks), but are also required to study various learning resources, such as magazines, newspapers and the internet.

This is important, so that what is learned is in accordance with the conditions and development of the community, so that there are no gaps in the mindset of students.

It also needs to be done in order to strengthen the goals of national education in the midst of international competition. The purpose of national education is to develop the potential of participants educate them to become people who have faith and are devoted to God Almighty, have good character, are healthy, knowledgeable, competent, creative, independent, and become citizens who are democratic and responsible for society and nationality.

This is what drives the desire of the writer to conduct a research at the Vocational High School (SMK) in order to get a definite picture of the influence of the development of science and technology on the learning achievement of class XI students at Pematangsiantar. This is reflected in how to increase knowledge in improving student learning achievement itself.

With the success of this research, a profile of the world of education can be obtained which is able to adopt the advantages and advantages of the technology for the future of students.

Formulation of the problem

Based on the background of the problem and the limitations of the problem, the researcher formulated the research problem as follows:

"Is there a significant effect of the development of science and technology on students' achievement of grade XI at SMK Teladan Pematangsiantar? "

II. REVIEW OF LITERATURE

The Importance of Information Technology in Learning According to Dr. Munir (2007: 50), in the current ICT era, the learning paradigm has shifted from traditional learning to technology-based learning. Learning is now not only using the blackboard. The instructor also not only lectures in front of the class while writing on the board, while students just sit, listen, and take notes. Various media resulting from technology including television, VCD, DVD, and computer become an important requirement in learning because of its ability.

Skills in utilizing ICT are life skills that must be possessed by students. These skills are as important as the ability to read, write, count, formulate and solve problems, manage resources, and work in groups. Students who do not have skills in ICTs are expected to experience greater difficulties in dealing with their lives in the present and the future.

The focus of attention on the development of ICT which is usually only on the purchase of sophisticated software / hardware in accordance with the trend and costly funds, has shifted to optimizing the ability of human resources (brainware) of ICT users, such as computer literacy.

The students are able to use computers optimally, know where to get them, understand how to package or process information, and understand how to communicate it.

This century is an era of the development of science and technology. These developments have a major impact on people's lives, because basically almost all aspects of modern people's lives cannot be separated from knowledge and technology. The community is demanded to be actively involved in the technological process that will play a role in the life of the present and the future. Communities that are active in the technological process will be able to choose, design, make and use the results of the engineering technology. Part of the community is a school in which there are students.

The students learn to design and make their own technological works. In addition, they are trained to find and solve problems in their daily lives that can be solved by utilizing technology.

ICT-based learning will be effective if we apply learning that is centered on student activities (student / learned centered learning), namely by:

1. Develop students' ability to solve problems in real life (contextual), so that education becomes relevant and responsive to the demands of everyday real life. The implication, the curriculum becomes more interesting and can stimulate the interests or motivation of students, because it can easily apply their knowledge in real life everyday.
2. Cultivating reflective thinking; and
3. Assist the development and active involvement of students in the learning process.

III. RESEARCH METHODOLOGY

The method used in this study was an experimental method with the intention to see the Effect of the development of science and technology on students' achievement of grade class XI SMK Teladan Pematangsiantar in academic year 2017/2018, then the research location is: at SMK Teladan Pematangsiantar located on the Singosari street No. 3. The reasons for choosing the location include:

1. The location of the school is easily accessible by transportation from the author's home or from the Pematangsiantar FKIP campus so as to save time and money used.
2. The schools meet the requirements to become objects of research because the data needed by researchers is available at the school.
3. The availability of the schools to accept researcher in conducting a research to collect data in this study.
4. The school has a well-accredited value regarding the development of science and technology so that researcher is interested in conducting research.

IV. THE FINDING AND DISCUSSION

To find out the influence of the development of science and technology (X) on the students' achievement (Y) of grade XI at SMK TELADAN Pematangsiantar in academic year 2017/2018, it was carried out using a simple linear regression formula, and the value obtained from the calculations is the in Appendix 9 (page 112) are as follows:

$$\begin{aligned} N &= 83 & \sum Y &= 6826 \\ \sum X &= 5543 & \sum Y^2 &= 565.020 \\ \sum X^2 &= 1.069.815 & (\sum X)^2 &= 46.594.276 \\ (\sum X)^2 &= 30.724.849 & \sum XY &= 454.602 \end{aligned}$$

then:

$$Y = a + bx$$
$$a = \frac{N \sum XY - (\sum X)(\sum Y)}{N \sum X^2 - (\sum X)^2}$$
$$a = \frac{(6826)(1.069.815) - (5543)(454.602)}{83(1.069.815) - (5543)^2}$$
$$a = \frac{7.302.557.190 - 2.519.858.886}{88.794.645 - 30.724.849}$$

$$a = \frac{4.782.698.304}{58.069.796}$$

$$a = 82,36$$

$$b = \frac{N\sum XY - (\sum X)(\sum Y)}{N\sum X^2 - (\sum X)^2}$$

$$b = \frac{83(454.602) - (5543)(454.602)}{83(1.069.815) - (5543)^2}$$

$$b = \frac{37.731.966 - 2.519.858.886}{88.794.645 - 30.724.849}$$

$$b = \frac{2.482.126.920}{58.069.796}$$

$$b = 42,74$$

Thus the simple linear regression equation about the development of science and technology (X) on student achievement (Y) of grade XI SMK Teladan Pematangsiantar is described as follows: $Y = 82.36 + 42.74x$

This means that if the development of science and technology (X) has a score of 77 then $Y = 82.36 + 42.27(77) = 3373$ or in other words if the development of science and technology has a score of 42.27 then it can be estimated that the students' learning achievement score (Y) is 33.73%.

To determine the degree of relationship between the development of science and technology (X) with student learning achievement (Y) then calculated using the simple correlation test formula as follows:

$$r = \frac{N(\sum XY) - (\sum X)(\sum Y)}{N(\sum X^2)(\sum Y)^2}$$

$$= \frac{(83(454.602) - (5543)(6826))}{83(1.069.815)(565.020)}$$

$$= \frac{3.102.709.028}{5.017.075.130}$$

$$r = 0,618$$

Based on the calculation above, the r value = 0.618 is obtained so that the influence of the variable X (science and technology development) with the Y variable (students' learning achievement) is categorized as strong, because it is in the interpretation criteria 0,600 - 0,790 Then the magnitude of the correlation coefficient of 0.618 or categorized as strong.

Hypothesis Testing

To test the hypothesis that has been proposed previously The formula:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$t = \frac{0,618\sqrt{83-2}}{\sqrt{1-(0,618)^2}}$$

$$t = \frac{0,618\sqrt{81}}{\sqrt{1-0,381924}}$$

$$t = \frac{5,56}{\sqrt{0,618076}}$$

$$t = \frac{5,56}{0,7862}$$

$$t = 7,07$$

To accept or reject a hypothesis that has been submitted, it was calculated by t-test analysis. The magnitude of t-count is 7.07 while the t-table is at a significant level of 95% or alpha 5% and the degree of freedom (df = n-2, 83-2 = 81), because it is not in the table t, then it looked for by using the interpolation formula:

$$\frac{a}{b} = \frac{c}{d}$$

$$\frac{81-60}{120-60} = \frac{x-1,67}{1,66-1,67}$$

$$\frac{21}{60} = \frac{x-1,67}{0,01}$$

$$0,21 = 60x - 100,2$$

$$x = \frac{100,41}{60}$$

$$x = 1,67$$

Because t-count > t-table or 7.07 > 1.67, thus the research hypothesis "There is a significant effect between the development of science and technology on the students' learning achievement of class XI students of SMK TELADAN Pematangsiantar" was accepted.

This study refers to the hypothesis which states that there is a significant influence between the development of science and technology with the achievement of class XI students of SMK TELADAN Pematangsiantar in Academic Year 2017/2018.

In accordance with the calculations that have been done, namely by calculating the influence of X and Y obtained an effect of 0.618 so that this shows a very strong influence between the development of science and technology with student achievement. Then the correlation results are tested by using the t-test hypothesis, the results of calculations show that $t = 7.07$ while t-table at a significant level of 95% and alpha 5% with Df (83-2) = (1.67).

This shows that t-count > t table or 7.07 > 1.67. Means the hypothesis stated that there is a significant influence between the development of science and technology with students' achievement of grade XI at SMK TELADAN Pematangsiantar in academic year 2017/2018, is accepted.

The development of science and technology in SMK TELADAN Pematangsiantar, when viewed from the calculations that have been made are classified in the strong category. This should be further improved because it will be very useful in the future. Because the development of science and technology is a progress in increasing knowledge. Therefore we use science and technology development as well as possible and we use it to positive things.

V. CONCLUSION

Based on the results of data analysis conducted by researcher, the following conclusions are obtained:

1. The Development of Science and Technology for students in class XI is "enough". This can be seen from the average value of respondents' answers to the science and technology development questionnaire that is equal to 2.25.
2. From the research results obtained an average learning achievement of 82.24. This shows that the learning achievement of Grade XI students in odd semester was categorized high according to the calculation table of the distribution of student achievement.
3. From the results of the calculation of the product moment correlation coefficient, it's obtained r-

count= 0.618. This shows that the influence of the development of science and technology on student achievement is categorized as strong because it is in the criteria of interpretation 0,600 - 0,790, according to the interpretation table value of r.

4. From the results of t-test calculations, to determine the contribution of the influence of science and technology development (X) with learning achievement (Y) obtained by 7.07 and t-table of 1.67 at degrees of freedom $dk = n - 2$, where $t\text{-count} < t\text{-table}$ or $7.07 > 1.67$.

This shows that the hypothesis stated that there is a significant effect between the development of science and technology on students' achievement of grade XI at SMK Teladan Pematangsiantar is accepted.

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