ISCE
Journal of Innovative Studies on Character and Education
ISSN 2523-613X
Volume 2 issue 1, Year 2018

THE INFLUENCE OF CONCRETE INSTRUCTIONAL MEDIA ON LEARNING ACHIEVEMENT

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ABSTRACT

The process of education is a very important policy and strategy for the implementation and improvement of the quality of education. Through the process of education, each teacher or school administrator can specify the learning process of a system, thus achieving the process to improve the quality of education can shape and influence the learning process. Within the overall educational process at school, learning takes a role in the most basic activities. This study aims to identify and analyze the significant influence of the use of concrete instructional media to the learning achievement of physics at Temperature and Heat Topic In Grade II Programa IPA to Cawu I in Ensino Secundário Geral No. 01 Baucau. This research was quantitative study using simple linear regression. The results showed that there is an influence of the use of concrete instructional media to learning achievement in which the value of F_{count} provides significant results between the use of concrete instructional media to learning achievement in Ensino Secundaria Geral 01 Baucau. Meanwhile, the value of t_{count} of 8.137 is greater than t_{table} that is equal to 1.997 on the significant value of 0.005, then the alternative hypothesis (Ha) is accepted and Ho is rejected. For simple linear regression equation Y = 1,264 + 0.590X. For the correlation coefficient is equal to 0.725 and the coefficient of determination (R2) of 0.526 or 52.6% which means that 52.6% the use of concrete instructional media (X) determines the improvement of the learning achievement in Ensino Básico Secundaria Geral 01 Baucau. The t-test results are greater than t_{table} or t_{count} (8.137) > t_{table} (1.997), then the alternative hypothesis (Ha) is accepted and Ho is rejected. Because t_{count} is located in the area of accepted Ha, then there is the effect of the use of concrete instructional media on students' learning achievement

Keywords: concrete instructional media, learning achievement

INTRODUCTION

Education takes an essential role and position in the national development because the goal is to improve the quality of human resources (HR). Education in general to humanize human being which is made through a process of teaching and training. Therefore, the teaching process is directed to create an atmosphere of learning that supports students' learning activities.

During the process of learning, problems and issues are inevitable. One of the issues is the students are less encouraged to develop the ability to think critically and creatively. frequently, students are directed to the ability to memorize the given information without being required to understand the information he or she remembered to connect with their everyday life. As a result, when students graduate from school,

they are smart and proficient in theory, but they are poor in the real application of the theory.

Thus, the efforts to improve the quality of education is very important for the education process since standards are indispensable in improving the quality of education and should receive the attention of the government or related agencies. In the standard implementation process of learning, the teacher plays as an imperative component, because the successful implementation of the learning process is highly dependent on the teacher as the facilitator.

Thus, learning as a process of changing behavior and as a result of interaction with the environment to meet the needs of life are essential. Through the education process, it always takes place in an environment which is an association between the human environment, relationships between educators with learners and others who are involved in the interaction of education where educational interaction can take place within the family, school, and community.

The low quality of education, especially Physics subject, indeed becomes the main concern of several related parties. Hence, it is urgent to look for factors that cause the low quality of Physics subject learning. The problems that cause are not only from external factors but also from internal factors which are more difficult to overcome. External factors are beyond the students and rooted in three main environments, family, school and community.

A field study of Physics is one of the basic science that plays an important role in supporting science and technology, (Sutriyono, 1999 in Soares 2000). It is known that Physics is part of the natural sciences which are arranged in basic science and a series of processes that are based on scientific attitudes in everyday life.

Instructional media is instruments (objects) that are used to demonstrate the fact, the concept of principle or specific procedures in order to make the concept seem more real or concrete. Without instructional media, the learning seems unbelievable difficult to achieve the objectives expected within certain educational institutions. In this activity, educational interaction is usually utilized for the nonmaterial and material instrument. Non-material instruments are in the form of verbal instruction, commands, prohibitions, advice and so on. While the material instruments or instructional media are in the form of a globe, slates, limestone, drawings, diagrams, paintings, slides, video and so on.

Where during the learning process in Ensino Secundario Publico No. 01 Bacau especially the topic of temperature and heat is fairly classic, because students are taught only to understand the content of the material through the teacher's explanation and practice but without the use of an concrete instrument that makes the students to obtain and comprehend better understanding.

Essentially, the teaching and learning process is a process of communication between teachers and students. In practice, the learning process is the transfer of knowledge, experience, and perception (ideas) from teacher to student or student to other students. In fact, the practice of learning is quite difficult to be achieved. This activity is highly dependent on the smooth interaction of communication between teachers and students. Lack of communication provides consequences of the message provided by the teacher. To prevent what is communicated creates confusion, misunderstanding or perhaps wrong concept, therefore, it is important to think about the ways of effective communication so that the knowledge, experience, and ideas communicated can be captured, digested and understood by students.

From such beliefs, it also brings in consequences on teachers how the need to understand the process of the formation of students 'conceptions so that teachers can design and implement learning that advance students' knowledge towards more scientific and reduces various conceptions among students.

THEORETICAL FRAMEWORK

According to Great Dictionary of the Indonesian Language of the Language Center (1990: 809), it defines that an instrument is an object used to achieve something, while the media is a tool or a medium of instruction to demonstrate the lesson's material and topics.

According to Great Dictionary of the Indonesian Language of the Language Center (2003: 28) that the instructional media is instrument or equipment which aims to educate or teach that what is taught is easily understood by students. Instructional media can be real objects (concrete). Instructional media in the form of real or concrete objects are objects that can be moved (manipulated) and cannot be presented in the form of written text in the book.

Teaching instructional media (teaching aids or audiovisual aids) is the instruments used by teachers when teaching to help to explain the subject topic which is being discussed to the students and prevent the occurrence of verbal on students. Instructional media is an instrument which aims to explain or realize the concept, (Ruseffendi 1994: 229).

According to Aristo Rohadi (2003: 10), instructional media are tools (objects) that are used to demonstrate the facts, concepts, principles, or certain procedures to provide more real or concrete illustration or explanation. Furthermore, IL Pasaribu, B.Simanjuntak (1983: 35) in Ninasari (2008; 26) states that the instructional media is a tool to help teachers impart and explain knowledge as well as transferring skills.

Meanwhile, Wens Tanlain, *at.al.* (1989:51) in Ninasari (2008; 26-27) state that the act of educating takes place using an educational instrument. An educational instrument is one of the educational factors that deliberately and used for the achievement of specific educational objectives. Meanwhile, other factors such as teacher education, students, objectives, and the environment, can be an educational instrument when it is used and planned in the action or purpose to educate, (Djamarah, S, Bahri., 2005: 184).

According to the above opinion, the writer can generate a conclusion that basically, students will be more easy to learn through the things that are concrete or real because it is difficult to understand something that is abstract. To understand a basic competency that is abstract, students require a concrete or real objects as an intermediary for the visualization of concept.

Instructional media or commonly referred to as a learning medium which Instructional media as a type of components in an educational environment that encourages students to learn. Three-dimensional instructional media models can be formed as a real object. Instructional media models are typically made simpler and uncomplicated with the intention that the basic concepts to be studied can be carefully evaluated and comprehended by the students.

The term media is derived from the Latin which is the plural form of medium, which literally means an intermediary or introduction. The general meaning of media is anything that can distribute information and resources to the recipient information. The term of media is very popular in the field of communication. The learning process is also essentially a communication process so that the media used in the learning process called instructional media, (M. Basyiruddin, 2002: 18).

Instructional media are objects that can be used to help students understanding closely the characteristics of the object so that it can facilitate students to understand the concepts and the characteristics of the object which are being studied. Instructional media can be a real object and can also be a model or the model imitation. To facilitate students in understanding the things that are abstract in learning physics, it is necessary to develop instructional media as an intermediary for the visualization of the students. Therefore, one way that can be done by teachers in applying the concept of abstract physics is taught using concrete instructional media.

According to the above-mentioned explanation, therefore, the authors can generate a conclusion that concrete instructional media is one of learning instrument which is applicable for teachers to facilitate in teaching in order to generate better understanding among students. Thus, what is being taught by teachers could be easily understood by students. The instructional media developed could be in the form of concrete or real

object or just its imitation. Instructional media should be flexible and it is not presented in the textbook.

In this research, the instructional media used is the concrete objects which are in the form of temperature and heat measurement instrument. The learning process employing instructional media is one of teacher's way to deliver the topic within a particular subject employing real instrument in accordance with the discussed topic. One of the benefits which could be obtained by employing instructional media is the ease and feasibility of both teachers and student in understanding and learning a particular topic. Instructional media is easy to be used and operated if it is prepared and designed well in accordance to the need of the learning.

According to Drs. Slameto (1987: 2) learning is a process attempt of a person to obtain a new behavior changes as a whole as a result of his or her own experience in interaction with the environment.

Learning is a process of change in behavior as a result of interaction with the environment in meeting their needs. But the essence of learning is changing, and change itself is an achievable goal as the final part of the learning activities, despite the fact that not all the changes are categorized as a learning process. Then he further emphasizes that learning can be understood as a phase of change that occurs in a person either nature or behavior because it is certainly not any change in a person is the change in learning.

In line with the aforementioned explanation, it is also emphasized by Prof. Dr. Oemar Hamalik (2001: 28) who argues that learning is a process of behavioral changes in the individual through the process of interaction with his or her environment. According to the several aforementioned theories, it can be concluded that learning is a process which is undergone by the individual to obtain certain new behavioral changes completely as a personal experience within his or her interaction with the surrounded environment.

Therefore, basically, the learning is a process of changing within the individual which is encouraged by the experience they undergo. In the process of changing behavior, it includes skill, habitual, knowledge, and aspiration changes. Meanwhile, experience within learning process is an interaction of the individual with the environment. Further, according to Sudjana (1996) and Thoifure (2008), they explain that guiding students in learning is an attempt to manage and organize the environment of students, encourage and facilitate students in learning.

Learning Physics is a part of learning Natural Science. In the process of Physics learning, students are not only dealing with the relationship of formulas, numbers, as

well as the operation. However, students should also be dealt with the ideas, structures, and correlations which are set logically. This is what makes Physics is related to an abstract concept.

According to Syah (2000), he explains that learning Physics basically encourage students to learning behavior. Meanwhile, according to Wahab (2007), he explains that Physics learning is not a learning activity which should be conducted by considering certain principles in order to achieve the goal of learning.

According to aforementioned learning concept, it can be concluded that Physics learning concept is a perspective regarding learning presentation in order to achieve the learning objectives. The aims of Physics learning are presenting the designed activities to assist students in obtaining and achieving the desired learning objective. Therefore, Physics learning concept is expected to generate better students' understanding regarding Physics.

METHOD

This research has been conducted in Ensino Secundário Geral 01 Baucau Vila Distrito Baucau. The research was conducted for 10 days in Trimestre I. Thus, the whole of the group in a particular area or place that will be the object of a study will be the conclusion of the study which is meant to be used as reference material or to deal with the problems that will be studied. This is supported by the opinion of Arikunto (2006: 130), who gives the definition that the entire population is the subject of research. If one wants to examine all elements within the study area, the research is the study of population.

According to the above-mentioned opinion, the authors can generate a conclusion that the population in this study is the entire students of Second Grade of Natural Science (IPA) on Trimestre I in Ensino Secundário Geral 01 Baucau, with the number of 193 people distributed into 4 classes as listed in the following table sample in this study as many as 66 people. To analyze the data in this study, it was using a questionnaire. In this study, data analysis techniques used by researchers was a simple linear regression.

FINDINGS AND DISCUSSION

To analyze the influence of concrete instructional media on students' learning achievement of Second Grade of IPA Trimester I in Ensino Secundário Geral No 01 Baucau, it employed matrix determinant method. Within this research, the authors provided questionnaire which consisted of questions regarding the influence of concrete

instructional media (X). The questions amount to 10 items which were related to the utilization of concrete instructional media and the tested indicators. To examine the degree of validity and reliability of each item, then the authors conducted try-out or trial for each item of questions on the same educational institution but with different classes. It was tested to the Second Grade of B CN to examine the validity and reliability level of each item of questions within the arranged questionnaire.

In addition, before statistical analysis was generated, the data regarding the results of response from the respondents should be first examined in terms of its validity and reliability. To facilitate the calculation regarding validity testing, then the authors employed SPSS 21.0 version for Windows program. If, the result of r is positive, and rcount > rtable, thus the items or the variable tested is valid or the significance rate is < 0.05. Next, it tested the validity and reliability of students' learning outcomes (Y). To test the variable of students' learning outcomes regarding temperature and heat topic in Physics, the authors employed the exam results of students. Hence, the validity of the item was not tested by the authors. Therefore, it only tested the calculation of correlation and regression.

To determine the significant influence of independent variable, concrete instructional media (X), on the dependent variable, students' learning outcome on temperature and heat topic (Y), a t-test was conducted by comparing the probability of tcount with the level of significance (0.05). In detailed, the data are presented in the following Table 1.

Table. T-test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.264	.342		3.702	.000
	VariabelX	.590	.072	.713	8.137	.000

a. Dependent Variable: VariabelY

The result of regression analysis showed that in the degree of freedom df = n-k-l =65 on the level of confidence of 95% or the level of fault of 0.05 which was obtained from the calculation of probability value of t-count as much as 8.137 higher than t-table of 1.997 on the level of fault (5%). Thus, it means that Ho is rejected and Ha is accepted. When Ha is accepted, it means that the utilization of concrete instructional media significantly influences students' learning achievement in Ensino Secundário Geral No 01 Baucau. So, it can be seen that the value of t-count for the utilization of concrete instructional media (X) is 8.137 on t-table with df of 65 and the significance rate of 0.05 obtained 1.997. Since the results indicated that t-count > t-table, therefore, Ho is rejected and Ha is accepted. According to the above-mentioned analysis, the equation of simple linear regression on Coefficients table above could be generated as Y = 1,264 + 0.590X. the interpretation from regression coefficient indicated that if the variable of students' learning achievement constant is as much as 1.264 and if the variable of the utilization of concrete instructional media (X) is increased one level, thus the variable of students' learning achievement (Y) is positively influenced as much as 0.590.

Meanwhile, (R) coefficient was used to determine the correlation between the independent and dependent variables of this research. If (R) coefficient is close to 1, thus the correlation is strong and in one direction. However, if the coefficient of correlation (R) is close to -1, thus the correlation is strong and in a different direction. Meanwhile, if the coefficient correlation (R) is 0, thus the correlation is weak.

Table 2. Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Durbin-Watson
1	.725[a]	.526	.518	1.584	1.930

a. Predictors: (Constant), Learning environment

b. Dependent Variable: Learning motivation

According to the results of analysis above, it obtained the correlation coefficient (R) as much as 0.725. The result indicated a positive correlation and the correlation is quite strong and in one direction. It means that if there is an improvement in the independent variable, the utilization of concrete instructional media (X), thus it will also simultaneously increase students' learning achievement in Ensino Secundaria Geral 01

Baucau. So, if the teacher frequently utilizes concrete instructional media during the process of learning, it also increases students' learning achievement in Physics subject and vice versa.

Determinant coefficient R^2 of 0.526 or 52.6% provides a meaning that 52.6% of the utilization of concrete instructional media (X) determines the improvement of students' learning achievement in Ensino Secundaria Geral 01 Baucau. Meanwhile, the rest of 47.4% are influenced by the other factors which are not taken into account within this research. However, as the findings explained, the utilization of concrete instructional media influences students' learning achievement.

According to the research findings obtained in Ensino Secundaria Geral 01 Baucau by distributing questionnaires to the 66 respondents which consisted of ten items regarding the utilization of concrete instructional media and students' learning achievement in temperature and heat topic of Physics subject. From each item given, it was analyzed using SPSS programs for Windows version 21.0 and it indicated that the F testing (simultaneous testing) provides a significant result between the utilization of concrete instructional media on the students' learning achievement in Ensino Secundaria Geral 01 Baucau. Meanwhile, the results of t-test indicated that the utilization of concrete instructional media has a significant influence on students' learning achievement in Ensino Secundaria Geral 01 Baucau with the score of t-count of 8.019 which is higher than t-table of 1.997.

In the results of the t-test, it can be seen that t-count is higher than t-table of t-count (8.137) > t-table (1.997). Therefore, it can be concluded that the alternative hypothesis (Ha) is accepted and the Ho is rejected. Because Ho is located within Ha which is accepted, there is an influence on the utilization of concrete instructional media with students' learning achievement. So, it can be concluded that coefficient correlation between the utilization of concrete instructional media and students' learning achievement in Ensino Secundaria Geral 01 Baucau as much as 8.137 and after being consulted with t-table, it indicated that the result is significant. It means that the coefficient could be generalized. Therefore, it could be stated that if the utilization of concrete instructional media is improved students; learning achievement will also be improved and vice versa.

CONCLUSIONS

According to the findings and the discussion of this research, the authors can generate a conclusion that there is a significant influence on the utilization of concrete instructional media where the F testing (simultaneous testing) provides a significant result between the utilization of concrete instructional media on the students' learning achievement in Ensino Secundaria Geral 01 Baucau. Meanwhile, the value of t-count as much as 8.137 is higher than the t-table as much as 1.997 on the significant rate of 0.005. therefore, the alternative hypothesis (Ha) is accepted in this study and the Ho is rejected. As for the simple linear regression is stated as Y = 1,264 + 0.590X. in addition, for the correlation coefficient, it obtained the value of 0.725 and the determinant coefficient (R^2) of 0.526 or 52.6% provides a meaning that the utilization of concrete instructional media (X) influences the students' learning achievement as much as 52.6% in Ensino Básico Secundária Geral 01 Baucau. Furthermore, the probability value of F-count as much as 66.206 is higher than F-table of 3.986. Thus, it can be concluded that the utilization of concrete instructional media (X) simultaneously influences significantly students' learning achievement (Y).

According to the research results conclusion, the authors would like to give important suggestion to the related stakeholders such as the government to pay attention and improve the evaluation system in school and take into account the Physics teachers within Timor Leste in order to be able to provide better topic presentation using relevant learning strategy in a accordance with the needs of the students to improve students' learning achievement.

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