International Journal of Advanced Educational Research
www.educationjournal.org
ISSN: 2455-6157
Received: 28-03-2022, Accepted: 14-04-2022, Published: 29-04-2022
Volume 7, Issue 1, 2022, Page No. 45-50

Effect of learning model and emotional intelligence on simulation learning outcomes and digital communication for vocational school students Muhammadiyah Manado

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Abstract
In order to educate the nation's life, improving the quality of education is important for sustainable development in all aspects of human life. This study uses a quantitative approach with an experimental method. The population in this study were students of SMK Muhammadiyah Manado. The research sample was the students of class X Nursing as the control class and those using the scientific learning model of class X TKJ students as the experimental class. The type of sample used in this study is a simple random sampling technique. This study uses a 2 X 2 factorial design, so a two-way analysis of variance (Two Way ANOVA) is used, which is the method used to test differences in variance of two or more variables. The main elements in the analysis of variance are the variance between groups and the variance within groups. The learning outcomes of simulation and digital communication in the group of students who were taught using a science-based learning model were higher than the group of students who were taught using a lecture-based learning model.

Keywords: learning model, emotional intelligence, simulation and digital communication

Introduction

Education in the current era of globalization is an important component in the development of a country. To become a developed and developing country, human resources (HR) are needed in terms of knowledge and experience.

These changes and improvements are aimed at bringing the quality of Indonesian education to a higher level. In order to educate the nation's life, improving the quality of education is important for sustainable development in all aspects of human life. The national education system must always be developed in accordance with the needs and developments that occur at the local, national and global levels.

Entering the era of globalization, the Indonesian people always carry out development in all areas of life, both material and spiritual development, including human resources.

Education is inseparable from learning activities. Learning includes active behavior, towards all situations that exist in the individual's environment, processes that are directed to a goal, the process of doing through various experiences, the process of seeing, observing, understanding something that is learned in the teacher's teaching and learning process. Teachers are required to be able to realize and create situations that allow students to be active and creative.

The concept of "teaching" begins with the assumption that students are like empty glasses, do not know anything and have no experience, so it is the teacher who is all-knowing and rich with experience filling or saving knowledge into the student's brain. This is an old view (paradigm) that can no longer be defended in the current context.

Some students may have experienced certain experiences related to learning while the teacher has not experienced it. For example, a teacher may have never done a live streaming in cyberspace (facebook) discussing the problem of covid-19 because they are not used to open mic in cyberspace, but the student has done it before because he is used to his parents who are YouTubers.

Students in today's context are no longer like empty glasses. They have learning potential and basic knowledge and certain experiences related to the material. For this reason, students need to be actively involved in the learning process as in the example above. Learning can be defined as the process of teaching students or making students learn (make student learn). It is the process of going through, experiencing and doing that in the end students will gain knowledge, understanding, forming attitudes and skills. In this context, it is students who are actively engaged in learning activities. Student learning activities referred to here are physical activity and mental activity.

The ability of students who are active in responding to a material is needed, in intellectual development. Because in Simulation and Digital Communication learning, an independent, interactive learning experience is needed, understanding the concept of problem solving well. it is an absolute requirement in achieving success in simulation learning and digital communication.

If a student is active and able to understand the concept of Simulation and Digital Communication subjects, then all the problems that exist in everyday life do not rule out the possibility of being resolved.

One of the steps that can be taken is to look for the factors causing the low learning outcomes of simulation and digi

-tal communication and then immediately take corrective steps. A learning model is a plan or pattern that teachers can use in designing learning materials and guiding learning in the classroom. Each teacher must choose an appropriate and efficient learning model based on the characteristics of students, the needs of students and the environment faced by students. Learner-centered learning model approaches include scientific-based learning models.

Research Methods

A. Research Approach

This study uses a quantitative approach with an experimental method. According to Hermawan (2006) [14], experimental research is a set of actions and observations, which are carried out to check or refute hypotheses or identify causal relationships between symptoms.

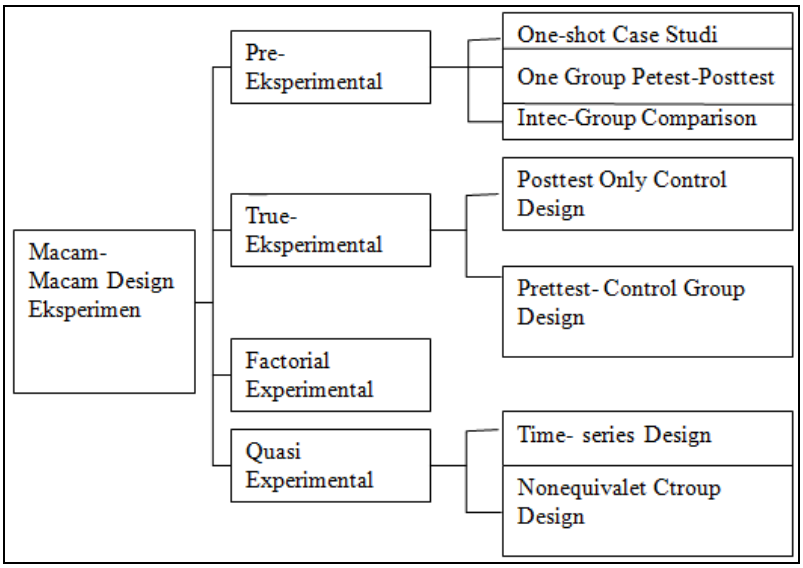

Fig 1: Kinds of Experimental Research Design

B. Research Design

This study was designed using a 2x2 level treatment by level design, as presented in the following table:

Table 1: 2 Research Design (2x2 Treatment by level)

B (Emotional Intelligence)	**A (Learning model)**	
	A1 (Lecture)	**A2 (Scientific)**
B1	A1B1 (Y)	A2B1 (Y)
(High EQ)	(Lecture-based learning model with high EQ)	(Scientific-based learning model with high EQ)
B2	A1B2 (Y)	A2B2 (Y)
(Low EQ)	(Lecture-based learning model with low EQ)	(Scientific-based learning model with low EQ)

Description
A; Learning Model
A1: Lecture-based learning model
A2: Scientific-based Learning Model
B; Emotional Intelligence
B1; High emotional intelligence
B2; Low emotional intelligence

C. Population and Sample

The population in this study were students of SMK Muhammadiyah Manado. The number of students of SMK Muhammadiyah Manado majoring in TKJ is 64 students and majoring in nursing is 81 students. So the total population is 145 people.

1. Research Sample

The samples taken in this study were students of class X Nursing as the control class and those who used the scientific learning model of class X TKJ students as the experimental class. The type of sample used in this study

is a simple random sampling technique. The sample of this research is part of the overall class X students at SMK Muhammadiyah Manado for the 2019/2020 school year.

D. Data Analysis Techniques

a. Test Requirements Analysis

The analysis prerequisite test was in the form of data normality test and data homogeneity test, then carried out a two-way ANOVA test to test the formulated hypothesis.

1. Data Normality Test
2. Homogeneity Test

E. Hypothesis Test

This study uses a 2 X 2 factorial design, so a two-way analysis of variance (Two Way ANOVA) is used, which is the method used to test differences in variance of two or more variables. The main elements in the analysis of variance are the variance between groups and the variance within groups. The variance between groups can be said as the numerator and the variance within the group as the denominator.

The steps taken in testing using ANOVA are: 1. Main effect hypothesis First hypothesis H0: There is no difference in the effect of direct instruction learning model and tactical game model on physical fitness level. Ha: There is a difference in the effect between the direct instruction learning model and the tactical game model on the level of physical fitness. Test Criteria: If the value of Sig. > 0.05 then H0 is accepted.

This means that there is no difference in the effect between the direct instruction learning model and the tactical game model on the level of physical fitness. Then if Sig. < 0.05 then H0 is rejected and Ha is accepted, meaning that there is a difference in the influence between the direct instruction learning model and the tactical game model on the level of physical fitness (Ghozali, 2013: 84) [13].

2. Interaction effect hypothesis The second hypothesis H0: There is no interaction between learning models and motor abilities on students' physical fitness levels. HA: There is an interaction of learning model and motor ability on the level of physical fitness of students. Test criteria: If the value of Sig. Interaction Learning Model * Motor Ability > 0.05 then H0 is accepted. This means that there is no interaction between the learning model and motor ability on the level of students' physical fitness. Then if Sig. <0.05, then H0 is rejected and Ha is accepted, meaning that there is an interaction between the learning model and motor ability on the level of students' physical fitness (Ghozali, 2013:84) [13].

3. Simple effect hypothesis Third hypothesis Further tests were conducted to determine the difference in the mean score of the dependent variable between the two data/sample groups and was a test of the simple effect hypothesis. Simple effect further test can be done using the Tukey test.

In an experiment with a 2 X 2 factorial design, there are a maximum of 4 simple effect hypotheses that need to be tested, but in this study only 2 hypotheses will be tested, namely:

(a) Hypothesis between A1B1 and A2B1 H0: The level of physical fitness of students who use direct instruction learning models is smaller/same than students who use tactical game models at high motor ability levels. Ha; The level of physical fitness of students who use the direct instruction learning model is better than students who use the tactical game model at a high level of motor ability.

Tukey Test Steps:

$$(1)\ Qh = \frac{11 - Y21}{s2\ n}$$

n = number of samples in one group

s = variance within the group

1. (2) Determine the value of Qtable (Qt) for = 0.05; n = number of data/sample in one group and k = number of data groups Qt = Q (0.05; k;n)
2. (3) Test criteria: Reject H0 if (accept Ha) if Qh > Qt Reject Ha if (accept H0) if Qh < Qt (Supardi, 2014: 357).

Fourth hypothesis (b) The hypothesis between A1B2 and A2B2 H0: The level of physical fitness of students who use direct instruction learning models is smaller/same than students who use tactical game models at low motor ability levels. Ha; The level of physical fitness of students who use the direct instruction learning model is better than students who use the tactical game model at a low level of motor ability.

Tukey Test Steps:

$$1.\ Qh = \frac{12 - Y22}{s2\ n}$$

n = number of samples in one group

s = variance within the group

1. Determine the value of Qtable (Qt) for = 0.05; n = number of data/sample in one group and k = number of data groups Qt = Q (0.05; k;n)

2. Test criteria: Reject H0 if (accept Ha) if Qh > Qt Reject Ha if (accept H0) if Qh < Qt (Supardi, 2014: 357).

F. Treatment Design

The design used in this research is seen from 3 aspects, namely:

1. Treatment Material,
2. Stages of treatment and
3. Implementation procedures.

1. Implementation procedure

The procedure for carrying out this experiment includes 3 stages, namely the preparation stage, the implementation stage and the evaluation stage.

a. Preparation phase
b. Implementation stage
c. Evaluation stage

In this study, 2 instruments were used, namely:

1. Instruments to measure student learning outcomes in simulation subjects and digital communication are divided into 2 types:

a. learning outcomes test grid which is measured based on 3 levels of ability C2 comprehension, C3 application and C4 analysis.

1. Validity test
2. Reliability Test

Results and Discussion

A. Overview of Research Implementation

This research was conducted at SMK Muhammadiyah Manado in the first semester of the academic year 20219/20220 with 55 research subjects consisting of 2 majors. The first department was TKJ, which consisted of 30 students consisting of 12 female students and 18 male students.

The second Department of Nursing has 25 students consisting of 22 female students and 3 male students. SMK Muhammadiyah is located on Jl. Satsuit Tubun No. 9, Istiqlal, Wenang, Manado City, North Sulawesi.

This research was carried out in 3 stages, namely the preparation stage, the implementation stage and the reporting stage. The type of research used in this research is the type of Factorial Experimental Design.

This design is a modification of the true experimental design, that is, by taking into account the possibility of a moderator variable affecting the treatment (the independent variable) on the results (the dependent variable). In this group, all groups were selected randomly.

B. Analysis of Student Learning Outcomes

Testing the research hypothesis of variance analysis (ANOVA) by applying univariate GLM which aims to examine the effect of the main factor and the effect of interaction factors on student learning outcomes of simulation and digital communication. The hypotheses tested are:

C. Testing the main factor hypothesis

The main factor hypotheses to be tested are as follows:

The learning outcomes of students who are taught with a scientific-based learning model are higher than students who are taught a lecture-based learning model at SMK Muhammadiyah Manado.

Statistically, the hypothesis can be formulated as follows:

H0: A1 A2

H1: A1 A2

D. Discussion of Research Results

The findings or analysis of research data as described in the previous section will be used as the basis for conducting further studies or analysis on

1. why scientific-based learning models affect simulation learning outcomes and digital communication
2. Why does the interaction between learning models and emotional intelligence affect learning outcomes?
3. Why are learning outcomes, especially students with low learning independence, the learning outcomes of students who are taught with a scientific-based learning model are better.

Conclusion

1. The results of learning simulations and digital communication in the group of students who are taught using a science-based learning model are higher than the group of students who are taught using a lecture-based learning model.
2. There is an interaction effect between scientific-based learning models and emotional intelligence on simulation learning outcomes and digital communication.

3. In the group of students who have high emotional intelligence, the results of learning simulations and digital communication between students taught with scientific learning models are higher than students taught with lecture-based learning models.
4. In the group of students who have low emotional intelligence, the results of learning simulations and digital communication of students who are taught using a lecture-based learning model are lower than students who are taught using a lecture-based learning model.

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