Student's Mathematical Ability based on Student Participation in Mathematics Education at Universitas Terbuka (UT) by Online Tutorial Activities in Calculus I Course

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Online tutorial activities is a learning activity provided by UT to support student learning. With this learning assistance services, it is expected that students could be understand the material.
This study aims to determine the extent of the influence of UT mathematics education students participation, which are to read weekly initiation material and post opinions in an online tutorial on Calculus I courses on students' ability to understand calculus I subject matter. This research is a quantitative descriptive study. A total of 24 students who took part in the online tutorial activity during the registration of 2018.2 in calculus I course were sampled in this study. Data was taken from the online tutorial website and documentation study. Data was processed using multiple regression by SPSS software.
The results of this study are all students participating in the online tutorial program in Calculus I during registration 2018.2, but the level of student participation in the form of reading material and posting opinions significantly had no effect on students' comprehension ability with p = 0.719, so further research on efforts that could improve student understanding in online tutorial activities.

Keywords: online tutorial activities, student participation, Calculus I course, UT Mathematics Education students

1. Introduction

The definition of curriculum according to chapter 35 of the DIKTI Law No.12 of 2012, namely (1) the higher education curriculum is a set of plans and arrangements regarding the objectives, content, and teaching materials as well as the methods used to guide learning activities to achieve the goals of Higher Education. The second

Curriculum definition, namely the Higher Education Curriculum as referred to in paragraph (1), is developed by each College by referring to the National Standards of Higher Education for each Study Program which includes the development of intellectual intelligence, noble character and skills, so that the Higher Education curriculum is referred to in paragraph (1) must include subjects: religion, Pancasila, citizenship and Indonesian [1].

According to Robert S. Zais in the Curriculum and Learning module in SD, the curriculum of an educational institution is based on five foundations, namely (1) philosophical assumptions, (2) epistemology (the nature of knowledge), (3) society / culture, (4) the individual, and (5) learning theory [2].

Creative learning activities can effectively increase students's knowledge [3], reading activities in mathematics learning can also improve students' mathematical understanding [4], a cultural approach in the mathematics curriculum increase self-confidence in students [5].

There are four basic foundations in developing a curriculum, namely philosophical, psychological, socio-cultural, and the development of science / technology [6]. The philosophical foundation which is the main foundation in other aspects. Different philosophical views will certainly produce different curriculum development applications. The philosophical foundation will produce national education goals, institutional objectives, objectives of the field of study, and instructional objectives. While the psychological foundation is related to psychology or learning theory and developmental psychology. Developmental psychology is used to determine the contents of the curriculum given to students so that the level of breadth and depth is by the level of development of students. The curriculum must be able to meet the needs of every student [7], and curriculum change must look at various mathematical aspects and educational systems [8], curriculum reform in mainland China-based on several years of research results teacher beliefs and perceptions of expected mathematics learning and teaching [9].

Learning psychology contributes in how the curriculum is delivered and how to learn it. Socio-cultural foundation becomes one of which is a consideration in curriculum development, because education always contains values that must be in accordance with the prevailing values in society. The foundation of science and technology (science and technology) is needed in curriculum development.

Along with the development of science and technology and the need for education, the distance education system, which is perceived as a 21st century innovation, because the education system has a wide range, space, time, and socio-economic, distance education system also opens access to education for anyone, anywhere, anytime. With these characteristics, the distance education system is often seen as a solution to various educational problems, especially those related to the even distribution and democratization of education, as well as the expansion of access to quality education to all levels of society. Through various legal instruments that have been issued by the government, among others, Regulation of the Minister of Education and Culture No. 24 of 2012 concerning the Implementation of Distance Education in Higher Education, Law of the Republic of Indonesia Number 20 of 2003 concerning National Education System, Government Regulation Number 17 of 2010 concerning Management and Implementation of Education which was later amended by Government Regulation Number 66 of 2010, and Law No. 12 of 2012 concerning Higher Education [10]. The distance education system has become an integral part of the world of education in Indonesia, and it become the choice for the community to gain access to education. This situation opens opportunities and opportunities for various higher education institutions to actively participate in distance education.

In its development, the distance education system has benefited greatly from the development of media and information and communication technology that can bridge the need for mass and broad education. The rapid development of technology led to a flexible and intelligent distance education model, able to open access to education for anyone across the boundaries of space and time, as well as overcoming various socio-economic problems.

2. Experimental Method

This study uses primary data from UT's online tutorial website, which can be accessed at www.elearning.ut.ac.id, the population is all undergraduate mathematics education students who take calculus I during registration 2018.2, the sample is the same as the population. This research was conducted in sept - nov 2018. The data used in the study were primary data, where the researcher is a teacher in calculus I subjects, so researchers can retrieve the research data needed directly. The data analysis phase is carried out after the data processing stage is done. At this stage the thing that is done is

to analyze the results of the calculation of the final score of students with multiple linear regression. The analysis that will be used in this study are: 1. Descriptive analysis is an analysis to see the final value of students. 2. Multiple linear regression analysis is an analysis to see the extent of the influence of reading initiation material, giving feedback in discussions affects the final value of students, with IBM SPSS V.25 software. The multiple linear regression model for the final grades of students is as follows: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon_i$. Where: Y = students grade in calculus I subject, α = constant, β1, β2 = coefficient of regression independent, variable X_1 = number of reading initiation material, X_2 = number of responding to discussion.

3. Result and Discussion

The data from the research are in the form of the number of views of each student from reading the initiation material, the number of posts for each student's discussion, and the final score for the Calculus I. The three data are processed with SPSS. The number of samples is 24 students.

H_1: variable reading material initiation affects the final grade of students

H_2: the variable posting responses for each discussion affects the final grade of students

H_3: variable reading initiation material and posting responses have a significant effect on the final grade of students

Testing Criteria:

For the H_1 and H_2 hypotheses

If the value is sig. t <0.05, then the hypothesis is accepted

If the value is sig. t> 0.05, the hypothesis is rejected

For H_3

If the value is sig. F <0.05, the hypothesis is accepted

If the value is sig. F> 0.05, the hypothesis is rejected

First test

H_1: variable reading material initiation affects the final grade of students

H_2: the variable posting responses for each discussion affects the final grade of students

The test results are as follows.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.685	1.995		1.346	.193
	VIEW	-.006	.029	-.108	-.221	.827
	POST	.042	.076	.270	.554	.586

a. Dependent Variable: Grade

Based on the data above the sig value. for view is 0.827 (p> 0.05), then the hypothesis is rejected, so that the reading variable does not significantly influence the final grade of students. Furthermore, the discussion post variable is 0.586 (p> 0.05), then the hypothesis is rejected, so the variable variable posting responses for each discussion has no effect on the final grade of students.

Second Test

H3: variable reading initiation material and posting responses have a significant effect on the final grade of students

The test results are as follows.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.922	2	4.961	.335	.719[b]
	Residual	295.882	20	14.794		
	Total	305.804	22			

a. Dependent Variable: NILAI

b. Predictors: (Constant), POST, VIEW

Based on the data above, the sig value is obtained. F is 0.719 (p> 0.05), it can be concluded that the hypothesis is rejected, meaning that the variable reading the initiation material and posting responses together does not significantly influence the final grade of students.

4. CONCLUSION

Based on the results of data processing with IBM SPS, it can be concluded that the reading variable does not have a significant effect on the final grades of students (p-value = 0.827), the post-response variable for each discussion has no effect on the final value of students (p-value = 0.586), also reading variables initiation material and posting responses together did not have a significant effect on the final grade of students (p-value = 0.719), so the final value of calculus I courses was not determined by student activity in participating in tutorial activities, both reading initiations and posting discussions, meaning students even though they were not actively participating in the tutorial activities, the students remained active to study independently, in accordance with the learning system at UT, which is independent learning.

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