



The Effectiveness of Contextual Learning in Financial Mathematics Problem for Senior High School

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Abstract

The purpose of this study is to describe the contextual learning given to senior high school students about financial mathematics problems. This research is a study that begins with the development of learning tools. This study uses a 4-D device development model from Thiagarajan consisting of definitions (definitions), design (design), development (development), and dissemination (disseminated). The research subjects were students of class XI at SMK Prapanca 2 Surabaya. Three classes were chosen at random: the test class, the experimental class, and the control class. The pilot class and the experimental class use a contextual learning model. While the control class uses a conventional learning model. The results showed that classical learning reached 9.268% of the experimental class students increased by 75% of the maximum score, effective student activity during learning, the ability of teachers to manage effective learning, and student responses to positive learning. While the classical learning completeness for the control class is classified as incomplete because only 78.05% of students exceed 75% of the maximum score. Based on inferential statistical analysis, the conclusions obtained from this study are the learning outcomes of students who take contextual learning better than the learning outcomes of students who take conventional learning.

Keywords: Learning Outcomes, Contextual Learning, Financial Mathematics Problems

Abstrak

Tujuan dari penelitian ini adalah untuk mendeskripsikan pembelajaran kontekstual yang diberikan kepada siswa sekolah menengah atas tentang matematika keuangan. Penelitian ini merupakan penelitian eksperimen yang diawali dengan pengembangan perangkat pembelajaran. Penelitian ini menggunakan model pengembangan perangkat 4-D dari Thiagarajan yang terdiri dari tahap pendefinisian (define), perancangan (design), pengembangan (develop), dan penyebaran (disseminate). Subjek penelitian adalah siswa kelas XI SMK Prapanca 2 Surabaya. Tiga kelas dipilih secara acak: kelas ujicoba, kelas eksperimen, dan kelas kontrol. Kelas uji coba dan kelas eksperimen menggunakan model pembelajaran kontekstual. Sedangkan kelas kontrol menggunakan model pembelajaran konvensional. Hasil penelitian menunjukkan bahwa ketuntasan belajar secara klasikal tercapai yaitu sebanyak 9,268% siswa kelas eksperimen melampaui 75% dari skor maksimal, aktivitas siswa efektif selama pembelajaran, kemampuan guru mengelola pembelajaran efektif, dan respon siswa terhadap pembelajaran positif. Sedangkan ketuntasan belajar secara klasikal untuk kelas kontrol tergolong tidak tuntas karena hanya sebanyak 78,05% siswa yang melampaui 75% dari skor maksimal. Berdasarkan analisis statistik inferensial, kesimpulan yang didapatkan dari penelitian tersebut adalah hasil belajar siswa yang mengikuti pembelajaran kontekstual lebih baik dibandingkan hasil belajar siswa yang mengikuti pembelajaran konvensional.

Kata kunci: Pembelajaran, Pembelajaran Kontekstual, Matematika keuangan

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Introduction

Mathematics is very close to everyday life. According to Fathani (2009), mathematics is a science that must be mastered by every human being and cannot be separated from everyday life. Many things related to mathematics on each side of our lives. Furthermore, mathematics lessons can provide students with provisions to solve problems in everyday life. Despite the importance of mathematics, the reality that occurs is that mathematics is considered a scourge for most students because mathematical objects are abstract, many formulas, involving calculations so that concepts in

mathematics are difficult to understand by students.

Such conditions can lead to low student achievement in mathematics. The quality of mathematics education for students in Indonesia is still not encouraging. This is consistent with UNESCO data, that the quality of mathematics education in Indonesia is ranked 34 out of 38 countries observed (Unjianto, 2012). Other data showing the low mathematical achievements of Indonesian students can be seen from the results of the International Statistics Center for Education Survey (National Center for Education in Statistics, 2003) of 41 countries in mathematics learning, where Indonesia ranked 39th below Thailand and Uruguay.

Understanding the low quality of student mathematics learning outcomes, the difficulties students face in mathematics are caused by several factors. Soedjadi (2005) states that the causes of student difficulties in the field of mathematics can be sourced from within students or also from outside students, for example how to present a lesson or learning atmosphere. Besides the teacher mastering the material, but the teacher is also required to have skills in delivering the material to be given. In addition, the way teachers create a classroom atmosphere will have an influence on student responses in learning activities. If a teacher is able and successful in creating a classroom atmosphere that can make students motivated and active in learning, the likelihood of student achievement outcomes also increases. Furthermore, Yanur (2013) states that the success of a student cannot be separated from the role of the teacher as the spearhead of education. The explanation shows that the teacher plays an important role in improving student achievement and has a responsibility in applying the learning process.

The low ability of students in mathematics can also be caused by the teacher and the learning carried out. The selection of learning models that are less precise, or ways of presenting material that are still too abstract can also cause students to be less optimal in learning mathematics. The results of the researchers' discussion with the mathematics teacher at the Vocational School also revealed that teachers usually still use teaching sequences such as: explaining mathematical concepts, giving examples of concepts just described, after that giving exercises similar to the examples just described, then students are asked to completing the exercises given by the teacher, after a few minutes the students were told to work on the board. Such teaching sequences are often used by teachers continuously at school. This shows that the teacher is less related to the concept of mathematics with the daily lives of students in carrying out learning. The teacher only explains mathematical concepts abstractly, as a result many students are more inclined to memorize formulas, without accompanied by an understanding of the actual concepts (Siswono, et al, 2018).

To overcome the gap between expectations and reality as stated above, appropriate models, approaches or methods are needed. Contextual Learning or Contextual Teaching and Learning (CTL) emphasizes student activities in full, both physically and mentally to be able to connect with real-life situations that encourage students to be able to apply them in their lives. Researchers hope that using contextual learning can lead to better competency achievement. This contextual learning model needs to be carried out so that students are interested in participating in learning from the beginning to the end of mathematics learning, and the teacher must be able to change the old habits of students who are

still teacher centers into new habits, namely students learn catively (student center). The contextual learning model allows students to be actively involved in learning.

Furthermore, based on the mathematics teacher interview class XI Accounting at SMK Prapanca 2 Surabaya before this study stated that this contextual learning is one of the learning models that has never been implemented and there are no contextual learning tools available in class XI Accounting. Therefore, researchers are interested in developing learning tools with contextual learning models for financial mathematics material in class XI Accounting at SMK Prapanca 2 Surabaya that are of good quality and effective, so that they can help students understand and implement them especially in daily life.

Method

The method in this study is experimental research that begins with the development of learning tools. The device development procedure used in this study is the -4D model (Thiagarajan, 1974). For the population in this study were students of class XI Accounting at SMK Prapanca 2 Surabaya. Every class have 35 students. One class is taken randomly as a device trial class. Two random classes were chosen as the research sample for the experimental class and the control class. For the experimental classes are given the contextual learning, while the control class is given conventional learning teaching.

The research instrument developed was a validation sheet of learning devices, teacher skills observation sheet, observation of student activity observation sheet, student response questionnaire, and learning achievement test. The observation sheet and questionnaire responses were adapted from previous studies. While learning outcomes tests are made by researchers. The subjects for the experimental class were 35 students of class XI Accounting at SMK Prapanca 2 Surabaya. The design of the experimental class used the design of two groups of pretest-posttest designs. This model uses two times the collection of data (Pretest and Posttest) on the subject of research.

Result and Discussion

Result

Based on the research objectives, a contextual learning tool for Financial Mathematics is obtained. The following equipment produced consisted of: Learning Implementation Plan (LIP), Student Worksheet (SW), and Learning Outcomes Test (LOT). To find out the quality of the learning kit, a learning device test is carried out. The achievement of the criteria of a good learning device is determined based on the results of the analysis of student activity data, the ability of the teacher to manage learning, student responses, and the results of the pretest and posttest. The results of the device trial can be seen in the following table:

Table 1. Achievement of Good Quality Learning Tool Criteria

No	Aspect	Note
1	Student Activity	Effective
2	Teacher's Ability to Manage Learning	Effective
3	Student Response	Positive
4	Learning Outcomes Test	Valid, Reliable and Sensitive

Furthermore, an experimental study was carried out, namely the implementation of contextual

learning in Financial Mathematics, specifically about Rent in Accounting XI class. The learning kit used is the final set of results developed in the previous stage. Data collected at this stage is the teacher's ability to manage learning, student activity data, student response data, and learning outcome data. The data is analyzed descriptively to determine the effectiveness of contextual learning.

Table 2. Learning Outcomes Test Scores

Values	Experiment Class	Control Class
The highest	100	98
Lowest	58	56
Average	87,24	78,68

Students are said to complete learning individually if the posttest score obtained is at least 75 out of a maximum score of 100 while a class is said to be completed classically if 75% of students complete it individually. The completeness rule is based on the policies established by SMK Prapanca 2 Surabaya.

Table 3. Complete Learning Outcomes

	Experiment Class	Control Class
Many students complete individually	38 students or 92.68%	32 students or 78.05%
Many students do not complete individually	3 students or 7.32%	9 students or 21.95%
Classical learning mastery	Complete	Complete

It can be seen in the table that in the experimental class, more than 75% or precisely as much as 92.68% of students finished learning individually. In other words, in class the mastery learning experiment is classically achieved. So contextual learning in Financial Mathematics material is said to be effective when viewed from the completeness of student learning outcomes. Conversely, in the control class subjected to conventional learning, classical learning completeness is also achieved but the percentage is smaller than the percentage of classical completeness in the experimental class. This is indicated by 21.95% of students not completing their studies individually.

Based on the description above, the achievement of the effectiveness of contextual learning is determined based on classical learning completeness, the ability of teachers to manage learning, student activities, and student responses to learning can be seen in the following table:

Table 4. Achieving the Effectiveness of Contextual Learning

No	Aspect	Note	Conclude
1	Student Activity	Effective	
2	Teacher's Ability to Manage Learning	Effective	Effective
3	Student Response	Positive	
4	Learning Outcomes Test	Completely classical	

From the table above it can be seen that contextual learning is effective for Financial

Mathematics material specifically about Rentes. As for ANAKOVA inferential statistical analysis is used to test the hypotheses proposed in the study, namely: 'Student learning outcomes that follow contextual learning are better than student learning outcomes that follow conventional learning for Financial Mathematics Material in Class XI Accounting at SMK Prapanca 2 Surabaya. After the independence test, it was concluded that the initial ability of students has a significant influence on student learning outcomes. While, from the linearity test, it was concluded that the regression model obtained can be used to show the effect of students' initial ability on student learning outcomes. Based on the results of the similarity and alignment test, it is known that the two regression models are not the same, but are parallel. Thus, it can be concluded that there is a difference between the learning outcomes of students who take contextual learning with the learning outcomes of students who take conventional learning for Financial Mathematics material. The respective regression models for the experimental class and the control class are:

$$Y_E = 71,17 + 1,04X_E$$

$$Y_K = 63,02 + 1,10X_K$$

From the two regression models, it can be seen that the regression line constant for the experimental class is greater than the regression line constant for the control class. This shows a significant difference. Geometrically, the regression line for the experimental class is above the regression line for the control class. This means that the learning outcomes of students who take contextual learning are better than the learning outcomes of students who take conventional learning for Financial Mathematics Materials in Class XI Accounting.

Discussion

Contextual learning involves students actively in their implementation. Based on Satriani, Emilia, and Gunawan (2012) that the contextual learning can help students to increasing about motivation and participate actively in the writing class, helping students to construct their writing, and helping students to solve their problems. For that the teacher no longer dominates learning, and students have plenty of time to discuss with other students in the group. This is in accordance with Piaget's opinion (Slavin, 1995) which states that the basis of learning is the activity of children when they interact with their social and physical environment. Child growth is a social process. The child does not interact with the physical environment as a bound individual, but as part of a social group. As a result, the social environment is between children and their physical environment.

Children's interactions with others play an important role in developing their views. Through the exchange of ideas with others, a child who had had a subjective view of something that would later turn into objective. These mental activities are organized in a structure of mental activities called "schemes" or patterns of behavior. In addition, students discussing in a group showed collaborating which is one of the characteristics of contextual learning. This is relevant to Vygotsky's theory where when students work in their closest developmental areas, tasks that cannot be completed on their own, so they need help from others or friends in completing them.

Conclusion

Based on the research results obtained by the development of learning tools using 4-D, produced contextual learning tools for good quality financial mathematical material. The learning kit consists of Learning Implementation Plan (LIP), Student Worksheet (SW), and Learning Outcomes Test (LOT). Because the requirements of a good learning device have been fulfilled that is the learning device has been declared by the validator and after being tested meets the valid criteria. Then contextual learning is effective for use in teaching class. Then, because the requirements for the effectiveness of contextual learning have been met, among others classical learning completeness achieved, namely as much as 92.68% of students scored $\geq 75\%$ of the total score, the ability of teachers to manage effective learning, effective student activities during learning activities, which indicated by each student's activity being within the ideal time tolerance criteria and students' responses to learning were positive, ie 95.12% of students chose the category of strongly agree and agree. Furthermore, based on the results of inferential analysis it can be concluded that the learning outcomes of students who take contextual learning are better than the learning outcomes of students who are taught conventionally for financial mathematical material in class XI at SMK Prapanca 2 Surabaya.

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