

Implementation of Computer Visualization Media as an Effort to Growth Development of Noble Children of Vocational School Students

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ABSTRACT

This study aims to describe how the implementation of computer visualization media can develop students' noble character in learning mathematics. This is classroom action research. This research was conducted in two learning cycles. In each cycle, there was a chain of repeated activities consisting of planning, action, observation, and reflection. The subjects in this study were 11th-grade students at one of the vocational schools in Makassar. The instruments used were noble character tests and observation sheets. The results showed that the class average score of the students' noble character test results in cycle I was 72.08 and it increased in cycle II to 72.67 which is in the already developed category. In addition, the percentage of students' activeness based on observation results was 77.78 which was in the very active category. Therefore, it can be concluded that learning using computer visualization media presented in the "Masa Matriks" integrated with moral values can develop students' noble character.

Keywords: *Computer Visualization Media, Noble Character.*

1. INTRODUCTION

The goals of Indonesia national education as stated in Law Number 20 of 2003 are closely related to the building of character of students so that they can compete, be ethical, have good morals, be polite, and have noble characters to interact in the community. This educational goal is based on developing social phenomena, such as the increase in juvenile delinquency in society, ranging from brawls, beatings, to immoral acts that have reached an unsettling level. Therefore, educational institutions as a place for the formation of student personality are required to improve the intensity and quality of character education. One way that can be done by education take holders to prevent the moral crisis from getting worse in the younger generation, character education needs to be integrated into every subject, including mathematics.

Character-based education is an effort to shape human morals to be good. The ultimate goal of moral education in the view of classical Islamic scholars is

to build positive characters and behaviours of students. As an adult, the teacher must have attached many characters that can be passed on to his students. It is enough for the teachers to strengthen their intentions to be role models and be imitated by their students, namely by having a noble character so that they can be trusted and imitated and become examples for their students. There are several studies related to noble character in learning mathematics such as study by Prabowo & Sidi [1], Nugroho [2], Dewi [3], Hartoyo [4], Bilda [5], Rosimandar [6], Abdussakir & Rosimanidar [7]; Abdussakir [8], Maryati & Priatna [9].

Due to the importance of character building in educational programs, some efforts are needed to develop noble character in students in learning mathematics. This can be done through the selection of approaches, methods, or learning strategies that will be used in the learning process and developing the content of mathematics subject.

Recently, in the scope of education, every teacher is required to be able to apply computers and technology either as teaching aids or learning media to deliver teaching materials to students either as teaching aids or learning media. For example, teachers can occupy computers as a learning medium to transfer mathematical material integrated with noble moral values.

The world has now entered the era of the industrial revolution 4.0 or commonly called society 5.0. In some countries, such as Japan which is currently developing society 5.0, has put humans as the main control in technology to integrate technology more deeply into everyday life [10]. Although Indonesia is still adjusting to the industrial revolution 4.0, teachers as the control centre in applying learning media should be able to use media and methods that are interesting, effective and interactive by integrating moral values in learning materials. By this effort, education can support society 5.0. The learning media that can be used for learning mathematics is the use of software Macromedia Flash MX 2004. By utilizing the Macromedia Flash MX 2004 software, teachers can create learning media using: serve interactive material in it load mathematical concepts, learning activities, and moral messages. Furthermore, it can be used to develop noble characters for students through learning media by utilizing the features of Macromedia Flash MX 2004. There are several studies related to macromedia flash-based computer visualization media such as Paradesa, Zulkardi & Darmawijoyo [11], Ashari [12], Rokhani [13], Budiantoh and Ranu [14], Nasrullah & Marlina, 2015 [15]; Wulandari, Ainy, and Suprapti [16]; Masykur, R., Nofrizal and Syazali, [17], Aadzaar, Arcana and Widodo [18], Islam and Fahmi [19], Setiyani and Santi [20].

This study focuses on the implementation of computer visualization media in learning mathematics as a way to develop the noble character of high vocational school students. The computer visualization media as a learning media was developed by using Macromedia Flash MX 2004 software which integrates moral values in learning materials. Therefore, this research aims to describe how the implementation of computer visualization media can develop students' noble character in learning mathematics. The learning media is called "Masa Matriks" media which has been developed using Macromedia Flash MX 2004.

Morals are a reflection of the heart so that whether a person is good or not can be indicated from

whether or not his character is good. People who have good morals, then it is a sign that he is good. On the other hand, if his morals are not good, then it is a sign that he is also not good [21]. Morals are a form (character) that is strong in the soul from which moral actions emerge *iradiyah ikhtiyariyah* (the choice will) in the form of, good or bad, beautiful or ugly according to his nature [22]. One of the efforts to transfer noble character education in mathematics learning is to use learning media. Therefore, according to Asyari [23] to produce graduates who are intelligent, faithful and devoted to Almighty Allah *subhaanahu waa ta'alaa*, as well as civilized, a planned and continuous effort is required through learning mathematics design (designed to form civilized graduate students) [23].

In the world of education in general, the process and practice cannot be separated from the use of technology [24]. In society 5.0, technology is not something that threatens but helps, facilitates, and improves human activities or work [10]. One of the technologies that can be used in learning mathematics is learning media in the form of software. Learning media are all tools or objects that can be used in teaching and learning activities, to convey material [15]. Meanwhile, according to Arsyad (2016), learning media are graphic, photographic, or electronic tools for capturing, processing, and rearranging visual or verbal information [25]. Computer visualization media are learning media in the form of animations made with the help of software that is operated on a computer to make it easier for teachers to visualize learning materials. One of the software that can be used to create learning media is Macromedia Flash MX 2004.

Some studies related to computer visualization media have been carried out by several researchers. For instance, Paradesa, Zulkardi and Darmawijoyo [11] who have studied the development of calculus 2 teaching materials using Macromedia Flash and Maple showed that the learning media created had a potential effect if used in the learning process on student learning outcomes. Another research is the study by Aadzaar, Arcana, and Widodo [18] who discussed the development of multimedia learning mathematics on the subject of circles in class VIII SMP made using Macromedia Flash. The results showed that students easily understand concepts in learning Mathematics by using multimedia learning mathematics that has been developed especially in the circle material.

Research related to noble character has also been carried out by several researchers. For instance,

Nugroho [2] has carried out a study about the application of mathematics learning methods that reflect the fundamental values of character education. He showed that the implementation of the fundamental values of the nation's character in learning mathematics could change students' attitudes in daily life. Students were easier to control in the learning process and it affects their mathematics learning achievement.

2. RESEARCH METHOD

This type of research is classroom action research. This research is divided into two learning cycles. In each cycle there is a chain of repeated activities, namely planning, action, observation and reflection. The learning model applied is a cooperative model. The subjects in this study were class XI at one of the vocational schools in Makassar. The instruments used are noble character tests and observation sheets. To see the qualifications of students' noble character test scores, the assessment criteria used are presented in Table [26].

Table 1. Criteria Assessment on the Noble Morals Test

Score Range	Noble Morals Score Qualification
81-100	BT
61-80	MB
41-60	ST
21-40	MT
0-20	BT

The information for each qualification of the Noble Morals score adapted from Parmi et al is as follows:

- BT = Not Seen (if students have not shown early signs of behavior as stated in the indicators).
- MT = Starting to Be Visible (if students have started to show early signs of behavior as stated in the indicator).
- ST = Already Growing (if students have shown various signs of behavior in accordance with those stated in the indicators but not yet consistent).
- SB = Already Developed (if students have shown various signs of behavior in accordance with those stated in the indicators and are starting to be consistent).
- MK = Becomes Habit (if students have consistently shown behavior in accordance with the indicators stated) [27].

3. RESULTS AND DISCUSSION

The "Masa Matriks" Media presents the material in the form of analogies, visual images, calculators and practice questions for matrix material. The following is a display of the "Masa Matriks" media presented in Figure 1.



Figure 1. "Masa Matriks" Media Display

One example of matrix understanding material that integrates moral values in the "Masa Matriks" media can be seen in Figure 2.



Figure 2. Example of Presentation of Material in the Form of Analogy

In addition to analogies, this Mass Matrices media has a special matrix calculator to make it easier to calculate and provide an understanding of the determinants and inverses of square matrices of order 2x2 and 3x3. The following is the display of the calculator on the "Masa Matriks" media, which is presented in Figure 3.

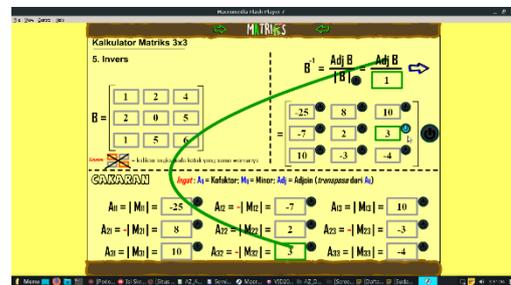


Figure 3. Calculator Display for Inverse Square Matrix of Order 3x3

The results of the analysis of the noble character test of students as a whole in the first cycle are presented in the following table.

Table 2. Results of Descriptive Analysis of Students' Noble Morals Test in Cycle I

Statistics	Score
Subject	23
Ideal Score	100
Highest Score	84,44
Lowest Score	48,89
Average Score	72,08
Standard Deviation	9,82

Based on the test results in the first cycle, the average result of the student's noble character test was 72.08 which was in the Already Developed category. Then proceed to cycle II to check the difference with cycle I.

Table 3. Results of Descriptive Analysis of Students' Noble Morals Test in Cycle II

Statistics	Score
Subject	22
Ideal Score	100
Highest Score	89,89
Lowest Score	53,33
Average Score	72,67
Standard Deviation	9,09

Based on the test results in cycle II, the average result of the student's noble character test is 72.67 which is still in the Already Developed category. Based on the success indicators that have been set, the success indicators have been achieved so that the action is stopped.

The results of the application of the "Masa Matriks" media showed good results. This is indicated by the average score of morals in cycle II is better than cycle I. In cycle I, the average grade for the student moral test reaches a score of 72.08 and increases in cycle II to 72.67 which is included in the Already Developed category. This means that for students' noble character during the learning process, overall students have shown various signs of noble character as stated in the predetermined indicators and have started to consistently do so. In addition, the percentage of student activity observations is 77.78 which is in the Very Active category. This shows that learning mathematics using computer visualization media in the form of "Masa Matriks" media can develop students' noble character.

4. CONCLUSIONS

Based on the implementation of computer visualization media in mathematics learning, the following conclusions can be drawn as follow:

1. Computer visualization media in the form of "Masa Matriks" media contains analogy of matrix material that is integrated with moral values in the form of analogies, calculators, and practice questions as media of learning topic of Matrix in class XI.
2. Overall, students have shown various signs of noble character in accordance with those stated in predetermined indicators and have started to do so consistently.

5. RECOMMENDATION

It is hoped that this "Masa Matriks" media can be an alternative media that can be used as an alternative media can be applied in the process of learning mathematics, especially in the topic of Matrix. In its application, it must be applied gradually with great patience. In addition, hopefully, this article can be a reference for readers in developing other learning media integrated with moral values to support society 5.0.

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