

THE EFFECT OF QR CODE LEARNING MEDIA ON STUDENT LEARNING OUTCOMES OF SMKN 1 NARMADA

M. Tanadi Saputra¹, Yohana², Sapka Mawarzani³

^{1,2,3}Pendidikan Ekonomi Koperasi, Universitas Qamarul Huda Badaruddin Bagu

¹Email : tanadisaputra25@gmail.com

Abstract

The problem in this research is whether there is an influence of QR Code learning media on the learning outcomes of students at SMKN 1 Narmada class X TKJ (Computer and Network Engineering). The method in this research is a type of quantitative research. The design used was a pretest-posttest control group design, namely forming two randomly selected groups, then the experimental group and the control group were given a pretest-posttest. In this study, respondents were grouped into two groups. The first group of the experimental class was given a pretest and then given treatment, namely by using interactive power point media, meanwhile the second group, namely the control class, was not treated the same as the experimental group, but was given lessons with normal learning which would be applied in the lesson. economy. The posttest was carried out on the same subjects, after the material was delivered during the learning period in both classes. The population in this study were all students of class X at SMKN I Narmada, the samples used in this study were class Narmada. Data collection techniques are carried out using test and documentation methods. The results of data acquisition are processed in the form of numbers which are analyzed based on statistical procedures. The results of this research are that there is an influence on student learning outcomes in experimental class students who were given treatment by learning using Qr Code learning media with control classes who were not given treatment. Because the learning outcomes of experimental class students are higher than those of the control class, it can be said that the Qr Code learning media influences student learning outcomes.

Keyword: *media, learning, QR Code, learning outcomes*

Introduction

Learning success is characterized by the achievement of objectives in terms of knowledge, attitudes, and skills. Many factors contribute to successful learning, one of which is learning media. This is supported by research by Eyler and Giles, which revealed that learning effectiveness is influenced by the media used by teachers (Riandita, 2023; 17). One development in learning media that utilizes technology and smartphones is the launch of QR Codes. Using QR codes can be a practical learning tool and is easy to access because the large amount of data is stored in a simple, quickly readable code (Solihatin, 2021). Quick response code learning media is a medium used in learning, becoming an innovative tool that will help improve student learning outcomes through a more effective learning process. Quick response codes facilitate students' rapid reception of information that can be translated quickly and used as a reference for collaborative learning. In addition, teachers will be able to understand the learning process taking place in the classroom, which is in accordance with the plan and the expected flow of learning objectives (Rani, 2023; 202).

Learning media comes in various forms, one of which is the QR (Quick Response) Code, designed like a card called a QR Card. QR Codes are an evolution of barcodes, from being one-dimensional to two-dimensional. QR codes contain information in both vertical and horizontal directions, while barcodes contain data in only one direction. QR codes hold a much larger volume of information than barcodes (Mustakim, S., et al. 2013:216).

Based on the explanation above, it is clear that technology significantly influences education, for example, learning media that involve technology. Selecting the right learning media can capture students' attention, interest in learning, confidence, and satisfaction in learning, thus improving student learning outcomes. To achieve effective learning, learning media are needed that can enhance student attention and interest. One way to achieve this is by using QR Code learning media. Learning using QR Code learning media will attract students' attention and interest because students can easily access learning materials through their mobile phones. Using QR Cards as a learning medium in teaching creates an active, effective, and enjoyable learning environment, thus impacting student learning outcomes. Researchers hope that these learning outcomes will lead to changes in students.

Student learning outcomes can be defined as something students can do that they could not previously do, as a reflection of student competency. Student learning outcomes are patterns of behavior, values, understandings, attitudes, appreciation, and skills, resulting from interactions in learning (Andriani, 2019; 81). Learning outcomes serve as the basis for measuring and reporting student academic achievement and are key to developing more effective learning designs that align what students will learn and how they will be assessed. As the final product of the learning process, learning outcomes are assessed to demonstrate what students have learned and developed (Ricardo, 2017; 193).

Based on pre-observations conducted at SMKN 1 Narmada on February 2, 2024, several problems were identified in the Natural and Social Sciences (IPAS) Project learning. The learning process was still teacher-oriented. Teachers who were less active in using learning media resulted in less effective and enjoyable learning, which resulted in students experiencing a lack of enthusiasm for learning. This in turn resulted in students' learning outcomes for the IPAS project falling below the minimum completion criteria (KKM). Based on the above description, an alternative solution was needed to improve the learning outcomes of the IPAS project, namely by implementing QR CODE learning media.

Research methods

This research is a quantitative research type, according to Kusumastuti (2020:3), who explains that quantitative research methods are methods for testing certain theories by examining the relationships between variables. This study used a pretest-posttest control group design, which involved forming two randomly selected groups, followed by a pretest and posttest for the experimental and control groups. Respondents were divided into two groups. The first group, the experimental class, was given a pretest and then a treatment using interactive PowerPoint media. The second group, the control class, was not treated the same as the experimental group but instead received a lesson using standard learning methods that would be applied to economics lessons.

Posttests were conducted on the same subjects, after the material was delivered during the learning period to both classes. The goal was to investigate the existence of cause and effect, and the extent of that cause and effect, by administering the treatments to the experimental and control groups for comparison on learning outcomes. In conducting this experimental research activity, the research techniques used were tests and documentation. The instrument used was a pretest-posttest. A test is a planned and systematic tool or procedure for measuring a particular behavior and describing it using numbers or specific categories. The test is then used to obtain student learning outcomes.

Results and Discussion

According to Sugiyono (2013:2), in his book, data obtained through research must meet certain criteria: validity, reliability, and objectivity. Validity indicates the degree of accuracy, namely the accuracy between the data that actually occurs in the object and the data that can be reported by the researcher. Meanwhile, reliability indicates the degree of consistency, namely the consistency of data over a certain time interval. And objectivity indicates the degree of similarity in perceptions between individuals. A good hypothesis should be specific and simple, able to explain facts, related to science, appropriate and based on research results, testable, and accountable for its accuracy (Alfira, 2016; 68). From the explanation above, it can be concluded

that research is the process of discovering information in the form of data that will be analyzed using numbers to solve the problem being studied.

This study aimed to determine the effect of QR Code learning media on student learning outcomes. This research was conducted at SMKN 1 Narmada. Two sample groups were used: class X TKJ B (Computer and Network Engineering) as the experimental class with 31 students and class X TKJ A as the control class with 31 students. Students in the experimental class were given treatment in the form of QR Code learning media, while students in the control class were not given treatment but used standard learning during the learning process. This study measured student learning outcomes in the Natural Sciences (Science) subject, specifically the topic "Economic Actors." Before administering the test instrument to the experimental and control classes, the researcher first conducted empirical validation by piloting the instrument in class X RPL A (Software Engineering), which had studied the topic "Economic Actors." The results were then tested for validity and reliability. Based on the validity and reliability tests, five of the 25 test questions were invalid, resulting in a total of 20 questions being used, which were found to be reliable.

A pretest was conducted to determine the initial abilities of students in the experimental and control classes. The students' initial abilities before the treatment had quite different average scores, namely 64.35 and 58.71. The pretest data were analyzed using the chi-square test and the F-test to determine the normality and homogeneity of the students' responses to the Economics Actors material in both groups. Based on the normality and homogeneity tests, the pretest results showed that both sample groups were normally distributed and homogeneous. This indicates that both classes had similar initial abilities before the treatment and that the data were normally distributed.

Students' final abilities were determined through a final test. The final test was administered after the treatment was administered. The average scores for the students' final abilities after the treatment were quite different between the experimental and control classes, namely 83.23 and 70.16, respectively. The final test data were analyzed using the chi-square test and the F-test. Based on the normality and homogeneity tests, the two sample groups were found to be homogeneous and normally distributed. The final test data were also used to determine the statistical tests used. The prerequisite test was analyzed and found that both classes were homogeneous and the data were normally distributed. After obtaining the prerequisite test results, the hypothesis test was continued. This hypothesis test was analyzed using a parametric statistical test, namely the pooled t-test of variance, and the value obtained was $6.551 > 2.000$ at a significance level of 5% and $\alpha = 60$. This indicates that the QR Code learning medium has an impact on student learning outcomes.

The results of the research indicate that student learning outcomes differ. Both the experimental and control classes experienced improvements, but the experimental class's improvement was greater than that of the control class. This is due to the researcher's

implementation of QR Code learning media in the experimental class. Using QR Code learning media for the Economic Actors topic makes learning more enjoyable, students become more enthusiastic about learning, and the learning process becomes less monotonous. In accordance with Azhar Arsyad's statement (in Lestari, 2019: 56), "Learning media can clarify the presentation of messages and information, thereby facilitating and improving the learning process and outcomes." From the above opinion, the researcher concludes that this study proves that the use of media can improve student learning outcomes, particularly the QR Code learning media used by the researcher in this study.

The findings of this study also support several previous studies, including those conducted by Dehana, A., M. (2024), which stated that the use of QR-Code-based learning media had an impact on student achievement in Civics (PPKn). Fauziah D. et al. (2018) stated that Accounting QR Card learning media can improve learning motivation in Grade XII Social Studies students at SMA Negeri 2 Bantul in the 2018/2019 academic year, although the increase was relatively low. Saleh, N. et al. (2018) stated that students gain a better understanding of the material when it is integrated with QR Code media.

The results of this study indicate that the learning outcomes of students who received QR Code learning were superior to those who received conventional learning, with an average learning score of 83.23 for the experimental class and 70.16 for the control class. This can also be seen in the data analysis, based on the hypothesis testing results and statistical calculations, which obtained a value of $\alpha > \alpha_{6.551} > 2.000$ at a 5% significance level. From these calculations, it can be concluded that the use of QR Code learning media can improve student learning outcomes.

Conclusion

Based on the research results and discussion, it can be concluded that there is an effect on student learning outcomes in the experimental class treated with QR Code learning media compared to the control class treated without this treatment. Because the learning outcomes of students in the experimental class were higher than those in the control class, it can be concluded that QR Code learning media has an effect on student learning outcomes.

This can be seen from the students' initial abilities before being given the treatment, which had quite different average scores: 64.35 for the experimental class and 58.71 for the control class. After being given the final ability test, the students' average scores were quite different between the experimental and control classes, namely 83.23 and 70.16.

This research proves Azhar Arsyad's opinion (in Lestari, 2019: 56): "Learning media can clarify the presentation of messages and information, thereby facilitating and improving the learning process and outcomes."

This is evidenced by the average learning scores of students in the experimental class of 83.23, higher than the average score of the control class of 70.16. The results of statistical tests showed that the value of $t_{hitung} > t_{tabel}$ yaitu was $6.551 > 2.000$ at a 5% significance level.

Therefore, it can be concluded that the use of QR Code learning media can influence student learning outcomes.

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