MASROKAH[1]✉, S. UTAMININGSIH[2], SU'AD[2], M.N. YERMAGAMBETOVA[3]
*[1]Master's Student of Muria Kudus University
(Indonesia, Gondangmanis), e-mail: masrokah646@gmail.com
https://orcid.org/0000-0002-9151-1214
[2]Senior Lecturer of Muria Kudus University
(Indonesia, Gondangmanis), e-mails: sri.utaminingsih@umk.ac.id; suad@umk.ac.id
https://orcid.org/0000-0002-2613-0052
https://orcid.org/0000-0001-5882-385X
[3]Lecturer of Abai Kazakh National Pedagogical University
(Kazakhstan, Almaty), e-mail: makhan1990@mail.ru
https://orcid.org/0000-0003-4682-2790*

INFLUENCE OF QUANTUM TEACHING-LEARNING MODEL ON SOCIAL STUDIES LEARNING OUTCOMES

Abstract. The purpose of this study was to determine the effect of the application of the quantum teaching-learning model on the learning outcomes of Theme 5 on the social studies content of grade V elementary school students in Demak Sub District. The research method used a quasi-experimental design. The research sample was class V Elementary School Bintoro Number 5 Elementary School (35 students). The control class was class V Elementary School Bintoro Number 2 with a total of 41 students. The sampling technique used purposive random sampling. Data analysis used t-test, by first doing data description, average similarity test, and analysis requirements test (normality test and homogeneity test). The results showed that the use of the quantum teaching-learning model had an effect on the learning outcomes of Theme 5 on social studies subject matter, as indicated by the results of the t-test of 3.446> 2,000 and the percent N-gain test of 59.50 (quite effective); Based on the research, it was concluded that there was an influence on the use of the quantum teaching-learning model on the learning outcomes of Theme 5 on the IPS subject content of elementary school students in Demak Sub District. The article analyzes the results of these studies.

Keywords: social studies, the quantum teaching-learning model, learning outcomes, quantum teaching, test.

Масрокax[1], С. Утаминингсих[2], Суад[2], М.Н. Ермагамбетова[3]
*[1]Мурия Кудус университетінің магистранты
(Индонезия, Гондангманис), e-mail: masrokah646@gmail.com
[2]Мурия Кудус университетінің аға оқытушысы
(Индонезия, Гондангманис), e-mails: sri.utaminingsih@umk.ac.id; suad@umk.ac.id
[3]Абай атындағы Қазақ Ұлттық педагогикалық университетінің оқытушысы
(Қазақстан, Алматы қ.), e-mail: makhan1990@mail.ru*

Квантты оқыту-оқу моделінің әлеуметтік зерттеулерді оқыту нәтижелеріне әсері

Аңдатпа. Бұл зерттеудің мақсаты 5-тақырыптың оқыту нәтижелеріне квантты оқыту-оқу моделін қолданудың Демак шағын ауданындағы V сынып оқушыларының әлеуметтік зерттеулер мазмұнына әсерін анықтау болды. Зерттеу әдісінде квазиэксперименттік жоба қолданылды. Зерттеу үшін таңдау Бинторо №5 бастауыш мектебінің V сыныбына түсті (35 оқушы). Бақылау сыныбы 41 оқушысы бар №2 Бинторо мектебінің V сыныбы болды. Іріктеу әдісінде мақсатты кездейсоқ іріктеу әдісі пайдаланылды. Деректерді талдау үшін алдымен деректерді сипаттау, орташа ұқсастық сынағы және талдау талаптары сынағы (қалыптылық сынағы және біртектілік сынағы) арқылы t-тесті қолданылды. Нәтижелер квантты оқыту-оқу моделін қолдану әлеуметтік зерттеулер пәні бойынша 5-тақырыптың оқу нәтижелеріне әсер еткенін көрсетті, бұл t-тестінің нәтижелері 3,446 > 2,000 және N-пайыз сынағы нәтижелері 59,50 (өте тиімді) арқылы анықталды. Зерттеу негізінде Демак кіші ауданындағы бастауыш сынып оқушыларының IPS пәнінің мазмұны бойынша 5-тақырыптың оқу нәтижелеріне квантты оқыту-оқу моделін қолданудың ықпалы бар деген қорытынды жасалды. Мақалада осы жүргізілген зерттеулердің нәтижелері талданды.

Кілт сөздер: әлеуметтік зерттеулер, квантты оқыту-оқу моделі, оқу нәтижелері, квантты оқыту, тест.

Масроках[1], С. Утаминингсих[2], Суад[2], М.Н. Ермагамбетова[3]
[1]магистрант Университета Мурия Кудус
(Индонезия, г. Гондангманис), e-mail: masrokah646@gmail.com
[2]старший преподаватель Университета Мурия Кудус
(Индонезия, г. Гондангманис), e-mails: sri.utaminingsih@umk.ac.id; suad@umk.ac.id
[3]преподаватель Казахского Национального педагогического университета имени Абая
(Казахстан, г. Алматы), e-mail: makhan1990@mail.ru

**Влияние квантовой модели преподавания-обучения
на результаты обучения общественным наукам**

Аннотация. Цель этого исследования состояла в том, чтобы определить влияние применения квантовой модели преподавания-обучения на результаты обучения Темы 5 на содержание социальных исследований учащихся пятого класса начальной школы в подрайоне Демак. В методе исследования использовалась квазиэкспериментальная схема. Выборкой для исследования был класс V начальной школы Bintoro Number 5 Elementary School (35 учеников). Контрольным классом был V класс начальной школы Бинторо №2, в котором обучались 41 ученик. В методе выборки использовалась целенаправленная случайная выборка. В анализе данных использовался t-критерий, сначала выполняя описание данных, тест на среднее сходство и тест требований к анализу (тест на нормальность и тест на однородность). Результаты показали, что использование квантовой модели преподавания-обучения повлияло на результаты обучения по Теме 5 по предмету социальных исследований, о чем свидетельствуют результаты t-теста 3,446> 2000 и теста процента N-прироста 59,50 (достаточно эффективный). На основании исследования был сделан вывод о влиянии использования квантовой модели преподавания-обучения на результаты обучения по Теме 5 на предметное содержание IPS учащихся начальной школы в подрайоне Демак. В статье проанализированы результаты этих исследований.

Ключевые слова: социальные науки, квантовая модель преподавания-обучения, результаты обучения, квантовое обучение, тест.

Introduction

Social Sciences (IPS) is a field of study that studies, examines, and analyzes social symptoms and problems in society in an integrated manner from various aspects of life [1]. Social studies are taught in primary and secondary education, as a basis or introduction in studying social studies or social science at an advanced level. IPS examines a set of events, facts, concepts, and generalizations related to social issues. At the Elementary School / Religion Elementary School level, the social studies subject contains Geography, History, Sociology, and Economics. Through the social studies subject, students are directed to become citizens of Indonesia who are democratic, and responsible, as well as citizens of the world who love peace.

This research learning problem also occurs in the fifth grade of Public Elementary School Bintoro Number 5 Demak. Based on the initial reflection, it shows that the social studies learning process is still not optimal, because the teacher does not use a learning model that is able to increase student cooperation in the study group so that not all students can be active in learning, students get bored quickly, and the use of learning media is still lacking, resulting in results. student learning is not optimal [2]. From the average daily assessment (PH) of Theme 5 in all subjects, the IPS subject content has a low average when compared to other subjects. Most students still have not reached the minimum completeness criteria set by the school, namely 70. Thus, the learning objectives are not in accordance with what is expected.

The choice of this model is in line with the results of the study showing that there are significant differences in the social studies learning outcomes of students who take the quantum teaching model assisted by audio media with students who take conventional learning [3]. Based on the analysis results obtained t-count of 2.72, with a significance level of 5% ($\alpha = 0.05$) or a confidence level of 95% with dk = 63 and t table of 2.00. This means that t-count> t-table (2.72> 2.00). Thus, it can be concluded that the quantum teaching model assisted by audio media has a positive and significant effect on the social studies learning outcomes of class students. Some of the reasons researchers chose the Quantum Teaching learning model are: (1) the model is that it involves students actively in the learning process, (2) the syntax of the model contains learning steps that the teacher can apply easily, (3) the application of the model brings logical consequences for teachers to prepare more mature learning preparation so that the learning process can be designed to be more innovative, and (4) the application of the two models further improves teacher competence, especially pedagogic and professional competences so that it will realize the quality of learning. Based on this description, the researchers conducted experimental research with the title "The Effect of Quantum Teaching Learning Models on Social Studies Learning Outcomes of Elementary School Students.

The Quantum Teaching Learning Model is very influential as an appropriate and good social studies learning model for social studies student learning outcomes in elementary schools [4]. The use of this model is proven to improve students' understanding and social studies learning outcomes of students in elementary schools [5], [6].

Based on the above background, the objectives in this study were to: (1) analyze the effect of the application of the quantum teaching learning model on the learning outcomes of Theme 5 on the social studies content of elementary school class V students in Demak Sub District, (2) to analyze the effect of the application of the talking learning model stick to the learning outcomes of Theme 5 on the social studies content of grade V elementary school students in Demak Sub District, and (3) to analyze the effect of differences in learning outcomes Theme 5 on the social studies content of grade V elementary school students in Demak Sub District on the learning process that applies the model learning quantum teaching.

Research methods

This research is an experimental research. The research method used a quasi-experimental design, with a population of all fifth grade students of Demak Elementary Schools from 55

elementary schools with a total of 1,627 students. The research samples were students of class VA Bintoro Elementary School 5 (34 students) and class VB Bintoro Elementary School 5 (35 students). As the control class is the fifth grade student of Bintoro 2 Elementary School (41 students). Data collection techniques in this study include test techniques in the form of cognitive tests. The research instrument was in the form of multiple choice written test questions. Data analysis used in this study includes: data description, average similarity test and prerequisite analysis test.

Results

Research findings described by the researcher contain the findings obtained during the study and after the research was carried out. The research findings data discussed are sourced from the results of the analysis of pre-experimental, pretest, and posttest data processing using the SPSS version 23 data processing program application. The explanation of the analysis of findings is to test the effect of implementing the quantum teaching learning model on student learning outcomes in Theme 5 on social studies subject matter.

Research Results

Pre-experimental Data. Pre-experimental activities are used to identify and determine the initial conditions of the two classes used as samples in the study. The initial problem that was analyzed was the learning outcomes of social studies students in class V Elementary Schools in Demak Regency. The stages of supporting pre-experimental activities include observation, interviews, and giving tests. Based on the three activities in the pre-experimental implementation, results that support the analysis of students' initial abilities can be obtained, namely the social studies learning outcomes in Theme 5 of the three classes sampled before the action of the research (treatment). The results of the data on the initial conditions of IPS Theme 5 learning outcomes from the pre-experimental implementation are described in the table below.

Table 1 – Pre-Experimental Results Learning Outcomes in Theme 5 of Social Studies

No	School/Class	Avarange	Student Complete	Student do not Complete	Minimum Completeness Criteria	%
1.	Public Primary School Bintoro Number 5 (Class 5a)	64,43	10	25	75	28.57%
2.	Public Primary School Bintoro Number 2 (Class 5)	63,57	11	30	70	26.83%

(Source: Primary Data December, 2020)

In table 1, the pre-experimental results of Theme 5 student learning outcomes on social studies subject matter before the research action of the 2 classes obtained an average percentage of completeness in the less category. Shown in the pre-experimental results of the learning outcomes of Theme 5 students in the first school social studies subject content obtained an average of 64.43 with a classical completeness percentage of 28.57% and 10 students who completed and 25 students who did not complete reached the minimum completeness criteria. In the second school the average results of Theme 5 student learning outcomes in social studies subject content of 63.57 with a percentage of 26.83% complete learning and 11 students completing and not 30. More clearly, the percentage of learning completeness can be illustrated by the following bar chart:
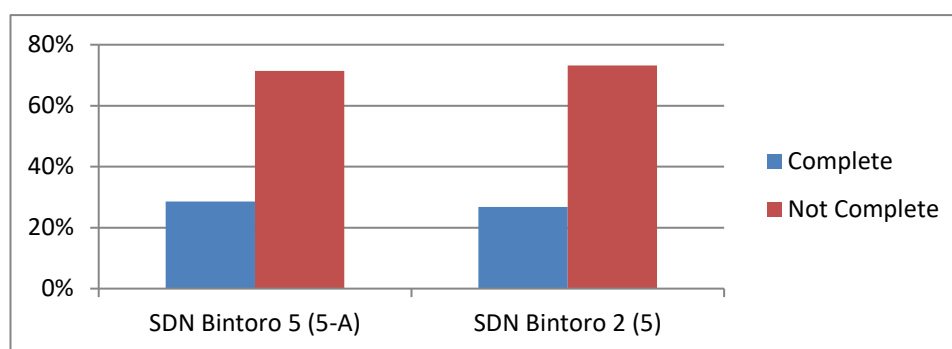
**Figure 1 – Bar Diagram of Pre-Experimental Results
of Learning Outcomes in Theme 5 IPS**

Data Description. The data description contains processed data from the pretest and posttest scores of the control class and the experimental class. The control class numbered 41 students. The explanation of the pretest data description for the experimental class is explained in the table as follows:

Table 2 – Description of Data

Date	N	Minim	Max	Mean	Std. Deviation	Variance
Pretest Class control	41	45	90	68,17	10,710	114,695
Posttest Class control	41	50	100	76,95	11,720	137,348
Pretest Class Experiment	35	40	85	69,00	11,167	124,706
Posttest Class Experiment	35	60	100	86,29	11,841	140,210

In Table 1, the data description shows that the pretest average value in the control class is 68.17 and in the experimental class is 69. This shows that the abilities of the two classes are almost the same, there is no significant difference in ability. The posttest mean value of the control class is 76.95 and the experimental class is 86.29, this shows that this significant difference in value occurs because of the influence of the model.

Hypothesis Testing. Hypothesis testing is used to test the effect of the application of the quantum teaching learning model on learning outcomes in Theme 5 on the social studies content of grade five elementary school students in Demak Sub District. The decision-making criteria for hypothesis testing using the Independent Sample Test are, if t-count> t-table then Ha is accepted and if on the other hand t-count <t-table then Ha is rejected. The explanation of the output data from the hypothesis test results can be seen in the following table.

Table 3 – Group Statistics

Group		N	Mean	Std. Deviation	Std. Error Mean
Class 5 Social Science Learning Outcomes	Experiment 1	35	86.29	11.841	2.002
	Control Class	41	76.95	11.720	1.830

Table 4 – Hypothesis Test Results

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Social science learning outcomes theme 5	Equal variances assumed	.000	.990	3.445	74	.001	9.334	2.710	3.935	14.734
	Equal variances not assumed			3.442	71.902	.001	9.334	2.712	3.928	14.741

Based on table 3 the results of the Group Statistic test using the posttest score of Theme 5 student learning outcomes in Social Studies subject matter are explained, the average value of student learning outcomes in Theme 5 on Social Studies subject matter after being given treatment in the experimental class is 86.29. In the control class the average value of social studies learning outcomes Theme 5 was 76.95 with a total of 41 students in the control class and 35 students in the experimental class.

Table 4 describes the results of the Independent Sample Test in the Equal Variances Assessment table, obtaining the results of t-count = 3,445, degrees of freedom (df) = 74 obtained from the number of samples-2. The level of significance at sig (2-tailed) = 0.001 and the mean difference (average difference) of 9.334. Based on the effect test using the Independent Sample Test, the data is said to meet the test criteria. Evidenced by the calculation results of t-count> t-table (3,445> 2,000) and a significance level of 0.001 <0.05, then, hypothesis testing justifies Ha = accepted and Ho = rejected. Thus, there was an increase in student learning outcomes in Theme 5 on social studies subject matter after using the application of the quantum teaching learning model which was higher when compared to the learning outcomes of Theme 5 on social studies subject matter using conventional learning. This concludes that there is an effect of the application of the learning model using the quantum teaching learning model on student learning outcomes in Theme 5 in social studies subject content for class V elementary schools.

Discussion

The results of the analysis of the effect of student learning outcomes in Theme 5 on social studies subject matter can be seen based on the results of the average test analysis on the posttest scores and the increase in the average score. The first data of Theme 5 student learning outcomes on social studies subject content in the experimental class I before the application of the quantum teaching model was 69.00, while the learning outcomes of Theme 5 students on Social Studies subject matter after the application of the quantum teaching model increased by 17.29 to 86.29.

The results of this study are in line with Suryani's [7] research on "Improvement of Students' History Learning Competence through Quantum Learning Model at Senior High School in Karanganyar Regency, Solo, Central Java Province, Indonesia" which concluded that the Quantum Learning Model is effective for improving historical competence. learning compared to the Expository Model. Students with high learning interest have a better history of learning competence than students with low learning interest. In addition, there is an interaction effect between learning approaches and interest in learning on historical learning competencies.

This means that there is an interaction between the influence of using the learning approach and interest in learning on the achievement of historical learning competencies [7]. In line with Suryani, the research entitled «An Investigation the Effect of Quantum Learning Approach on Primary School 7th Grade Students» Science Achievement, Retention and Attitude «Achievement test and attitude scale were used for data collection». Quantum learning was applied in the treatment group and the current program was applied in the control group during the study. As a result of the study; Quantum Learning Approach affected students' academic achievement, retention and attitude marks in a positive way [8].

The acquisition of an increase in student learning outcomes in Theme 5 on social studies subject matter before (pretest) and after (posttest) the action (treatment) shows that the use of the quantum teaching learning model can have an effect in increasing the learning scores of themes 5 students on social studies subject matter. The effect is in line with the research results of Rachmawati [9] which show that the abilities of the two classes are indeed different, so the Quantum Teaching Method is still not optimal for improving students' abilities. Meanwhile, the soft skills (problems & communication) between the two classes are different, in terms of the quantum teaching method it is optimal to improve students' soft skills [9], [10]. In line with Racmawati, the research with the title "Improving Learning Outcomes of Linear Program with Quantum Teaching Model at Grade X Students of SMK-BM PAB 3 Medan Estate." 51.3% with a mean score of 64.86 (low). In the second cycle 86.49% with an average value of 77.29 (average). The results showed that learning with the Quantum Teaching Model can improve student learning outcomes on linear program material at SMK - BM PAB 3 Medan.

Meanwhile, the application of the quantum teaching model by analyzing student responses [11]. Analysis of student responses is obtained from a questionnaire where the questionnaire is a sheet that must be filled in and used to determine the level of object response to teaching and learning activities in class. The questionnaire in this study was given to all XI-MIPA3 classes who had participated in the teaching and learning process. The questionnaire given by the students covered six aspects of assessment, namely: whether the teacher taught, understood the instrument or not, helped understanding or not by implementing multiple intelligence learning with the quantum teaching strategy, were students interested in learning [12]. What researchers do is re-use in learning other materials, whether physics lessons involve or not after using multiple intelligence learning with quantum teaching strategies, whether learning uses multiple intelligence with quantum teaching strategies [13], [14].

The results of this study are also reinforced by the results of hypothesis I testing using the mean (average) data on the posttest scores of experimental class I, the effect of using the quantum teaching learning model on the learning outcomes of Theme 5 on social studies subject matter, obtaining t-count = 3,445, t table = 2,000. , and the significance level in the table sig (2-tailed) = 0.01 so that the results of t count> t table (3,445> 2,000) and the significant level is less than a = 0.05, then, Ha is accepted and Ho is rejected.

The application of the quantum teaching learning model has a positive influence in improving student learning outcomes in Theme 5 on social studies subject matter. Before the implementation of the model, the learning process was less than optimal, this was evidenced by the average score of Theme 5 IPS subject content in the pre-experimental and pretest implementation ≥ Minimum completeness criteria determined by the school, while after treatment by applying the quantum teaching learning model the student learning process experienced a significant increase related to higher student learning outcomes and the courage to express ideas independently.

The existence of positive responses and feedback in learning can provide its own advantages from the effect of the use of the quantum teaching learning model on student learning outcomes in Theme 5 on social studies subject matter. This is in line with research on «An Investigation on Quantum Learning Model». According to Zeybek's research, it was found that students who are actively involved in the learning process learn better [15]. Due to the interaction of information,

vocabulary changes and increases. In order to adapt to this change, one must effectively improve his skills and abilities [16]. Therefore, various methods and techniques have been developed in education. One of them is quantum learning, whose models are developing. The results of the study concluded that quantum learning had a positive effect on student academic achievement and self-confidence.

The effect of the inclusion of the quantum teaching learning model can be seen based on the analysis of the average gain of the percent N-gain score test in the experimental class I. The experimental class I obtained the percent gain test results of 59.50% in the quite effective category whereas, in the control class that applied the conventional model obtained an average N-gain score of 31.51% in the ineffective category. This is in line with DePorter's opinion in his book «Quantum Teaching Teaching Teachers to Become Good Teachers». Because the student learning process depends on how the application and learning strategies take place. Quantum teaching has a main principle that is in line with the model itself, namely applying fun learning. The main principle of quantum teaching is «take their world to our world, and deliver our world to theirs». This principle tries to give the understanding that it is important for teachers to know the world of their students, and form a bond that the world of teachers here is also full of interesting things so that students can know the importance of bonds and broad knowledge [17]. Using information technology in teaching leads to cognitive development [18–22]. This can have an impact on how children solve new problems that will come. Quantum teaching also promotes learning in a way of thinking that can encourage students to become individuals who can explore the potential contained in these students, in this case the quantum teaching learning model plays a role in exploring students' interest in learning [23].

From the comparison of the mean gain of the percent gain score (%) between the experimental class I and the control class, it is clear that the acquisition of the percent gain score for the experimental class I is higher when compared to learning using conventional models. Thus, the application of the quantum teaching learning model developed by researchers has a positive effect in learning, especially social studies.

Conclusion

The use of the quantum teaching learning model has an effect on the learning outcomes of Theme 5 on the social studies content of grade V elementary school students in Demak District. The effect given after applying the quantum teaching learning model is 3.446> 2,000 and a significance value <0.05, then Ha is accepted. The increase in learning outcomes in Theme 5 on social studies subject matter is seen from the average before treatment of 69.00 and after treatment of 86.29 and based on the N-gain test of 59.50 in the category of quite effective so that the application of the quantum teaching learning model has an effect. positive on learning outcomes in Theme 5 on social studies subject matter.

Suggestion. For teachers, students should be more actively involved in the learning process by designing innovative learning models, managing class dynamically, directing multidirectional interactions so that the learning process takes place meaningfully. In addition, teachers need to apply the selected learning syntax coherently and carry out material development in accordance with student characteristics and learning materials.

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