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Improving Creativity in Social Studies Learning Using the Quantum Teaching Model

Johana Ermina Setyaningtyas*[*1], Firosalia Kristin[1], Indri Anugraheni[1]
[1]Faculty of Teaching and Education, Universitas Kristen Satya Wacana - Indonesia

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Abstract. This classroom action research aims to examine the effectiveness of the Quantum Teaching learning model in enhancing student creativity within the context of social studies learning. Conducted from April 27 to May 7, 2018, at SDN Banyubiru 03, the study involved second-grade elementary students. Data were collected through tests, observation sheets, and creativity rubrics. The results showed a progressive improvement in student learning outcomes and creativity across three cycles. Student achievement meeting the Minimum Completion Criteria (KKM) increased from 30% in the pre-cycle to 67% in Cycle I, and 84% in Cycle II. In terms of creativity, the percentage of students in the "creative" category improved slightly, while those in the "non-creative" category decreased significantly. These findings indicate that the application of the Quantum Teaching model supports the development of creativity and learning outcomes in early social studies education, contributing to more engaging and human-centered instructional practices.

Keywords: *Quantum Teaching; Social Studies Learning; Creativity; Educational Innovation; Learning Outcomes*

***Corresponding Author:** Johana Ermina Setyaningtyas (ersejoanaa@gmail.com), Faculty of of Teaching and Education, Universitas Kristen Satya Wacana, Salatiga - Indonesia

Introduction

Prior to advancing to higher levels, elementary education is an essential starting point for children's cognitive, skill, and character development. Thus, the elementary school learning process must be effectively planned to allow pupils to balance the development of their academic and non-academic potential. Schools strive to provide their students with the information, abilities, and moral fibre they need to succeed in life. Ensuring optimal implementation is the vital responsibility of basic education. Through behavioural changes, school education seeks to improve students' knowledge, abilities, and attitudes towards learning (Siswoyo, 2013).

Carla Rinaldi states in 30 Tips for Raising Independent, Creative Children (2006) that "the ability of early childhood education to bridge the gap between the home and school learning environments is critical to its success." It is predicated on how the child, instructor, and parents engage and communicate with one another. This statement implies that in order to help pupils reach a high degree of comprehension and focus, support should be balanced.

As stated by BNSP (2006) in connection with the curriculum standards for Elementary and Secondary Education Units, "the subject of Natural Social Studies (IPA) is something related to finding out about the natural environment systematically." As a result, IPA encompasses both the process of learning and the comprehension of a body of knowledge expressed as facts, ideas, or principles.

Scientific inquiry should be used to teach science in order to develop students' capacity for scientific thought, behaviour, and work as well as their communication skills in daily life. As a result, the application and development of scientific process skills and attitudes are key components of science education in elementary schools (Depdiknas, 2006; Rustaman, 2003). Students should gain conceptual understanding through experience, investigation, and reflection as a result of this process. Students are therefore expected to comprehend what they have learnt in science classes in primary school rather than absorb information from the teacher. To ensure that students grasp the information thoroughly and enthusiastically, teachers must offer learning strategies that might encourage their interest in and appreciation of science-related subjects (Sanjaya, 2011).

The findings of observations and conversations with teachers at SDN Banyubiru 03, Semarang Regency, indicate that teaching and learning activities exhibit innovation and student learning outcomes. Nevertheless, only 43% of students who did not finish the subject believe

that scientific studies in grade 2 were worthwhile. Furthermore, only three students experimented with the material of changes in object form by creating varied shapes out of plasticine. Only two students were in charge of cutting and sticking the paper during the folding paper exercise; the majority of students concentrated on folding without adding any additional components.

Interviews with three students and a teacher at SDN Banyubiru 03 led to the conclusion that there are still a number of significant barriers to science education. The one-way nature of the teacher-student contact and the lack of student response are among the primary grievances. Learning efficacy is decreased as a result of this passive and dull learning environment. Learning results and limited creativity are also impacted by students' lack of participation in the learning process. This circumstance suggests that in order to establish an enjoyable and significant learning environment, more interactive learning models—like Quantum Teaching—that can promote active student participation must be implemented.

The Quantum Teaching model is one tactic that can be utilised to increase students' creativity in science learning. Context and content are the two categories into which the learning components of Quantum Teaching can be separated (Rachmawati, 2012). Quantum Teaching focuses on dynamic relationships in the classroom environment, interactions that establish the foundation and framework for learning. Quantum Teaching encompasses principles for effective, efficient, and progressive teaching design, along with presentation methods, to achieve impressive learning outcomes in a short time. Quantum Teaching employs a learning design framework known as TANDUR: Grow, Experience, Name, Demonstrate, and Celebrate (Shoimin, 2014).

In response to the existing problems, action needs to be taken to improve students' creativity and learning outcomes in science subjects by implementing learning models. Quantum Teaching can specifically enhance creativity because it provides space for students to express themselves, experiment, and discover the meaning of learning through enjoyable learning experiences. Furthermore, this model also encourages improved learning outcomes because it involves multiple senses and emotions in the learning process, thereby strengthening students' absorption and understanding of concrete and applicable science material.

The main objective of the study in grade 2 at SDN Banyubiru 03 is to investigate how the Quantum Teaching learning model can be applied to enhance students' creativity and learning outcomes in Natural Sciences (IPA) classes. The study focuses on how this model's

implementation steps can foster an enjoyable, engaging, and purposeful learning environment to promote students' active engagement in the learning process. The implementation of the Quantum Teaching paradigm is expected to improve student learning results and creativity significantly.

There are two ways to look at the advantages of this research: theoretically and practically. Theoretically, this research should help advance creative learning studies, especially those that focus on learning models. A helpful strategy for raising the standard of science instruction in primary school is quantum teaching. Additionally, this study contributes to the corpus of knowledge about learning models that foster students' creativity and cognitive development.

Meanwhile, practically, it is anticipated that the findings of this study will help educators develop more engaging and student-centred learning by providing them with an alternate approach. For students, the application of *Quantum Teaching* can help create a more enjoyable learning experience while also encouraging creativity and a deeper understanding of science material. For schools, this research is expected to serve as a reference in developing more adaptive and innovative learning practices, tailored to the needs and characteristics of students in the modern education era.

Methods

This study used a collaborative Classroom Action Research (CAR) approach between the researcher and the classroom teacher. Wardani (2008) explains that CAR is a type of research conducted by teachers in their classrooms with the aim of improving the quality of learning and student learning outcomes. In this context, the researcher acts as the designer of the learning actions, while the classroom teacher acts as the implementer of the activities in the field. These action activities are also collaboratively monitored by the researcher and colleagues to ensure objectivity in the observation and reflection process. The learning model applied in the action is Quantum Teaching, because this model is considered capable of creating a fun learning atmosphere, motivating, and simultaneously increasing creativity and student learning outcomes.

Thirty second-grade kids from SDN Banyubiru 03 in Semarang Regency served as the study's subjects. This study was carried out during the second semester of the 2017–2018 school year. With the intention of assessing the efficacy of the Quantum Teaching model based on

documented field data, this study can also be classified as archive research (secondary data) because it employed data from the prior time. The study was carried out in two cycles, with three parts in each cycle: planning, action and observation execution, and reflection.

Data collection was conducted using several techniques. First, a written test was used to measure student learning outcomes with multiple-choice questions structured based on fundamental science competency indicators. Second, to measure student creativity, an assessment rubric was used that included indicators such as fluency, flexibility, originality, and elaboration, referring to Torrance's theory of creativity (in Munandar, 2009). Third, an observation sheet was used to record the learning process, both teacher behaviour and student activity, during the implementation of the Quantum Teaching model.

Data analysis techniques used were descriptive, quantitative, and qualitative. Quantitative data came from student test results, which were analysed to determine the improvement in learning outcomes scores from cycle I to cycle II. A creativity rubric and observation notes were used to gather qualitative data, which was then narratively examined to characterise how the intervention affected students' learning behaviours and creativity. Data validity was strengthened by using data from documented sources and through a collaborative process between researchers to ensure the objectivity of observations.

The success of the action was determined through two main aspects: learning outcomes and student creativity. This research was declared successful if at least 80% of students achieved the Minimum Completion Criteria (KKM) in science learning outcomes and demonstrated an increase in creativity scores based on the rubric used.

Results

The research was conducted using the planned steps of the Quantum Teaching learning model. The study was carried out in two cycles, each cycle consisting of three meetings. The following is a comparison of the science learning creativity of grade 2 SDN Banyubiru 03 from the pre-cycle, cycle I, and cycle II in the recapitulation obtained from the research using the Quantum Teaching learning model in Table 1.

Table 1.
Comparison of the Distribution of Science Learning Creativity Based on the Percentage of Students Who Were Quite Creative in Pre-Cycle, Cycle I, and Cycle II of Grade 2 Students at SDN Banyubiru 03

Learning Creativity Category	**Cycle**					
	Pre Cycle	**frequency**	**Cycle I**	**frequency**	**Cycle II**	**frequency**
Very Creative	0%	-	3.33%	1	10%	3
Creative	0%	-	10%	3	13.33%	4
Quite Creative	33.33%	11	36.33%%	10	43.33%	13
Not Creative	63.33%	19	53.33%	16	33.33%	10
Very Uncreative	0%	-	0%	0	0%	0
Overall Category	Not creative		Quite creative		Creative	

From the recapitulation results of table 1 which shows a comparison of the increase in creativity in learning science at SDN Banyubiru 03, this can be seen from the very creative category in the pre-cycle 0%, in cycle I 1 student (3.33%), and in cycle II increased to 3 students (10%). For the creative category, in the pre-cycle, 0% of students were involved. In cycle I, this increased to 3 students (10%), and in cycle II, it reached four students (13.33%). In the fairly creative category in the pre-cycle, as many as 11 students (33.33%) participated. In cycle I, this number increased to 10 students (36.33%), and in cycle II, it increased to 13 students (43.33%). Furthermore, in the non-creative category in the pre-cycle, 19 students (63.33%) were involved. In cycle I, the number of students decreased to 16 (53.33%), and in cycle II, it declined to 10 (33.33%). According to Conny R. Semiawan (2009: 44), creativity is the modification of something that already exists into a new concept. In other words, there are two old concepts combined into a new idea.

Below you can see a comparison of the science learning outcomes of class 2 SDN Banyubiru 03 from the pre-cycle, cycle I, and cycle II in the recapitulation obtained from research using the learning model. *Quantum Teaching* in Table 2.

Table 2.
Comparison of the distribution of science learning outcomes based on pre-cycle, cycle I, and cycle II completion of grade 2 students at SDN Banyubiru 03

No	Mark	Pre Cycle		Cycle I		Cycle II	
		Number of Students	Percentage (%)	Number of Students	Percentage (%)	Number of Students	Percentage (%)
1	Completed	9	30	20	66.66	25	83.33
2	Not Completed	21	70	10	33.34	5	16.67
Amount		30	100	30	100	30	100

From the recapitulation results in Table 4.8, it can be seen that nine students (30%) achieved learning completion in the pre-cycle. After implementing the Quantum Teaching learning model in the learning process, there was an increase from the pre-cycle to cycle I to 20 students (66.66%), and there was also an increase from cycle I to cycle II to 25 students (83.33%). In this case, in the pre-cycle, the number of students who had not yet completed reached 21 students; then, in cycle I, it decreased to 10 students. Furthermore, from cycle I to cycle II, the number of students who had not yet achieved the KKM score decreased to 5 students.

The results of the study indicate that the implementation of the Quantum Teaching learning model has a positive impact on increasing creativity and learning outcomes of grade 2 students of SDN Banyubiru 03 in science subjects. This study was conducted in two cycles, each consisting of three meetings, with systematic observations of changes in creativity levels and student learning outcomes before and after the intervention.

From the creativity aspect, there was a significant change in the distribution of student creativity categories. In the pre-cycle, the majority of students were in the "not creative" category, namely 63.33% (19 students), while no students were included in the "very creative" or "creative" categories. However, after the implementation of the Quantum Teaching model, a shift occurred in the first cycle: the "very creative" category began to appear with a percentage of 3.33% (1 student), the "creative" category became 10% (3 students), and "quite creative" increased to 36.33% (10 students). This change was increasingly visible in the second cycle, where students included in the "very creative" category increased to 10% (3 students), "creative" to 13.33% (4 students), and "quite creative" increased again to 43.33% (13 students).

On the other hand, the number of students in the "not creative" category decreased consistently to 33.33% (10 students) in the second cycle. This reflects that the Quantum Teaching model has succeeded in creating a learning atmosphere that is more stimulating for students' creativity and expression.

This increase in student creativity aligns with Conny R. Semiawan's (2009) view that creativity is the process of modifying something that already exists into a new concept. Quantum teaching supports the development of creativity to its maximum potential in the classroom by giving students a platform to engage more actively in exploring ideas and openly voice their thoughts.

In addition to creativity, the study's findings also revealed a notable enhancement in the learning outcomes of the students. In the pre-cycle stage, only 30% (9 students) achieved learning completion according to the Minimum Completion Criteria (KKM). After the implementation of the Quantum Teaching model in cycle I, learning completion jumped to 66.66% (20 students). This increase continued until cycle II, where 83.33% of students (25 students) successfully achieved the completion score. On the other hand, the number of students who had not completed the learning decreased drastically from 70% (21 students) in the pre-cycle to 33.34% (10 students) in cycle I, and again to only 16.67% (5 students) in cycle II.

Quantum teaching is a successful learning approach for improving student learning results and creativity, according to statistics. Classroom dynamics have been shown to improve with this approach, which emphasises engaging, meaningful, and pleasurable learning. Students' academic performance is enhanced by this strategy, which also helps them reach their full potential, especially in terms of creative and collaborative thinking.

Discussion

This study proves that the implementation of the Quantum Teaching learning model has a positive impact on increasing creativity and learning outcomes of second-grade students at SDN Banyubiru 03 in Natural Sciences (IPA). The learning process, designed through two cycles, resulted in higher student active involvement compared to before this model was implemented. Quantum Teaching combines emotional, physical, and social elements in

learning to create a conducive and enjoyable classroom atmosphere (DePorter & Hernacki, 2000; Dimyati & Mudjiono, 2006). With this approach, learning is no longer one-way, but interactive, dynamic, and student-centred.

There has been a notable increase in student creativity. In the past, students frequently relied only on textbooks and Student Worksheets (LKS) as their primary learning resources. However, students started to participate in group discussions actively, make direct observations, and work together to solve problems after Quantum Teaching was put into practice. Students are encouraged to come up with fresh ideas and use their thinking constructively through these exercises (Munandar, 2002; Slavin, 2009). This procedure exemplifies the idea that an educational setting that promotes inquiry, mental freedom, and the bravery to express oneself may nurture creativity.

During the learning process, students showed progress in conveying ideas and answering questions, and were more confident in presenting the results of their group work. Quantum Teaching provides a broad space for expression, strengthens self-confidence, and fosters students' intrinsic motivation in learning (DePorter & Hernacki, 2000; Sani, 2014). Intense social interaction in small groups also contributes to the formation of a supportive learning climate, which ultimately improves creative thinking skills and collaboration among students (Johnson & Johnson, 1999; Vygotsky, 1978).

In addition to the creativity aspect, student learning outcomes also improved after implementing this model. Previously, students often struggled to understand science concepts, but with more meaningful learning, they more easily grasped the core of the material. This suggests that student engagement in active learning can help improve conceptual understanding and mastery of subject matter (Kristin, 2016; Arends, 2008). The Quantum Teaching approach, which integrates various learning styles and visual-auditory-kinesthetic methods, has proven effective in meeting students' individual learning needs (DePorter & Hernacki, 2000; Slavin, 2009).

Teachers are also given the chance to assess student learning outcomes more thoroughly with this learning approach. Instructors can evaluate the learning process, including group projects, discussion involvement, and the way students present their findings, in addition to the final product. This genuine assessment is in line with the formative

assessment methodology, which prioritises the process over the final output (Muijs & Reynolds, 2017; Black & Wiliam, 1998). Additionally, group work presentations by students enhance the emotive and psychomotor components, which are sometimes disregarded in traditional evaluations.

This study's strength is its thorough method of assessing learning outcomes and creativity. While examinations and contextual learning activities are used to evaluate learning outcomes, a rubric with structured criteria is used to assess creativity. Along with cognitive achievement, this examination measures students' bravery, teamwork, and learning persistence (Anderson & Krathwohl, 2001; Asriningtyas, 2018). Therefore, it is possible to view Quantum Teaching as an adaptive and successful learning approach that encourages pupils to learn as much as they can.

From these findings, it can be concluded that Quantum Teaching not only improves academic achievement but also fosters creativity and a positive attitude toward learning. This strategy creates an interactive and enjoyable learning environment, so that students feel motivated to actively participate in every learning process (Sanjaya, 2011; DePorter & Hernacki, 2000). Therefore, this model is worth considering as an alternative innovative learning strategy, especially at the elementary school level.

Conclusion

The findings of the study indicate that the Quantum Teaching learning model has been successful in improving the learning outcomes and creativity of second-grade students in studying Natural Sciences (IPA) at SDN Banyubiru 3. This model is able to create an active, fun, and meaningful learning atmosphere so that it encourages students to be more involved in the learning process, both individually and in groups. The increase in student creativity is reflected in their ability to express ideas, discuss, and present the results of group work. Concurrently, a greater comprehension of concepts and a higher achievement of the Minimum Completion Criteria (KKM) demonstrate an improvement in learning outcomes. Thus, in an attempt to raise the standard of instruction in elementary schools, quantum teaching can be employed as an alternative, cutting-edge teaching method.

Author's Declaration

Authors' contributions and responsibilities

√ The authors made substantial contributions to the conception and design of the study.

√ The authors took responsibility for data analysis, interpretation and discussion of results.

√ The authors read and approved the final manuscript.

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Availability of data and materials

√ All data are available from the authors.

Competing interests

√ The authors declare no competing interests.

Additional information

No additional information is provided for this research.

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