Talking Stick Learning Model Assisted by Media Question Box: Effectiveness on Science Learning Outcomes in Elementary Schools

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A B S T R A K

Pembelajaran IPA masih konvensional menyebabkan siswa kurang fokus dan mendapatkan nilai dalam kategori rendah. Tujuan penelitian untuk menganalisis keefektifan penggunaan model pembelajaran talking stick berbantuan media questions box terhadap hasil belajar IPA di Sekolah Dasar. Jenis penelitian kuantitatif dengan desain eksperimen. Pemilihan sampel menggunakan simple random sampling. Subyek penelitian siswa kelas V SD. Rancangan penelitian menggunakan "One Group Pretest-Posttest Design" melibatkan satu kelompok tanpa kelompok pembanding. Teknik pengumpulan data observasi dan tes. Teknik analisis data menggunakan teknik analisis statistik deskriptif dan analisis statistik inferensial. Hasil penelitian menunjukkan bahwa setelah diterapkannya metode pembelajaran talking stick berbantuan questions box mengalami peningkatan sehingga sebagian besar nilai siswa masuk dalam kategori tinggi. Berdasarkan hasil analisis, keluaran Independent Sample T Test diketahui nilai Sig. (2-tailed) sebesar 0,000, maka H0 diterima, sehingga terdapat perbedaan rata-rata antara hasil pretest dan posttest. Model pembelajaran talking stick berbantuan media questions box efektif meningkatkan hasil belajar IPA bagi siswa. Implikasi penelitian ini, guru dapat menerapkan model pembelajaran untuk mengembangkan hasil belajar dan keaktifan siswa di dalam kelas.

A B S T R A C T

Science learning is still conventional, causing students to be less focused and get grades in the low category. The research objective was to analyze the effectiveness of using the talking stick learning model assisted by the media questions box on science learning outcomes in elementary schools. This type of quantitative research with experimental design. Selection of the sample using simple random sampling. The research subjects were fifth-grade elementary school. The research design used the "One Group Pretest-Posttest Design" involving one group without a comparison group. Observation and test data collection techniques. Data analysis techniques using descriptive statistical analysis techniques and inferential statistical analysis. The results showed that after applying the talking stick learning method assisted by the questions box, it increased so that most student scores were in the high category. Based on the analysis results, the output of the Independent Sample T Test is known to be the value of Sig. (2-tailed) of 0.000, then H0 is accepted, so there is an average difference between the pretest and posttest results. The talking stick learning model assisted by the question box media effectively improves science learning outcomes for students. This research implies that teachers can apply learning models to develop learning outcomes and student activity in the classroom.

1. INTRODUCTION

The success of the learning process can be invisible from the learning outcomes obtained by students, so the learning process requires the readiness and ability of the teacher or educator to choose learning methods that can improve student learning outcomes. Based on Law no. 20 of 2003 in Article 37, paragraph 1, one of the subjects in elementary schools, which is a vehicle for equipping students with knowledge, skills, and attitudes, is science content. The science learning process in elementary schools needs to create learning conditions that can encourage students to be active and curious. Therefore, teachers in designing science learning in elementary schools can consider the involvement of various sensory organs owned by students and the development of science and technology in students (Putri et al., 2017; Redhana, 2019). Science learning is a collection of knowledge containing facts, concepts, and principles related to everyday phenomena. Learning activities require innovation, such as learning media that can create concrete material (Juniati & Widiana, 2017; Sayekti & Kinasih, 2018). Science learning in elementary schools design so that students experience a process, not just sit and receive a wealth of

knowledge from the teacher. It was synthesized that the content of science lessons is class content that teaches about natural phenomena related to human life (Megawati, 2018; Panjaitan, 2017; Tompo et al., 2016).

Facts on the ground show that the science learning method is not following the characteristics of science subjects. As the facts found by researchers when observing SD Negeri 3 Nambuhan, it is known that teaching and learning activities in schools have returned to normal due to a government policy that requires face-to-face learning activities. Students follow the learning process, especially the content of science lessons, well. However, in terms of activity, understanding of the material, mastery of concepts, and assignments, there was no increase after implementing online learning, and there were still students who were not fluent in reading. Activeness in learning there are only a few students who are active in learning, while assignments are given to each student because in giving assignments, there are still students who work on them at school. In addition, when face-to-face learning takes place, many students are less focused and less disciplined in doing assignments, so most students get grades in the low category. During learning activities, the teacher uses conventional lecture learning. So it is necessary to have an innovative learning model by the teacher in conveying material so that students can receive and understand the material presented.

Creative learning activities such as role-playing can develop students' knowledge so that innovation in learning can improve students' contextual understanding. An effective learning model to overcome these problems by improving 21st-century skills in learning, by implementing active and student-centred learning so that an approach with an active learning model is needed. An increase in student misunderstandings is an indication of a decrease in learning. Misunderstandings arise when students do not understand the principle of the phenomenon or the working mechanism (Handhika et al., 2015; Laksana, 2019; Üce & Ceyhan, 2019). This misunderstanding means that students cannot explain the phenomenon comprehensively. Increasing student misunderstandings when doing online learning reduces the intensity of learning. Another result of misunderstanding is the inability of students to implement and discover concepts, ideas, and mechanisms based on known phenomena. (Halili, 2019; Liu & Fang, 2016). Due to emergency learning situations and circumstances, there may be some misunderstandings. It is synthesized as an alternative that teachers can use to improve student learning outcomes by innovating in the selection of learning models and media (Liu & Fang, 2016; Sajidan et al., 2022; Vosniadou & Skopeliti, 2017).

Learning media also greatly influences the learning process so that students more easily understand the material to activate students. The existence of learning media can help students think in real terms through the media used in the learning process because it can be seen directly (Özerem, 2012; Saribas & Ceyhan, 2015; Vosniadou & Skopeliti, 2017). Learning media are message carrier technologies and means of communication in print or visual form to convey information from educators to students (Gamage et al., 2020; Hall et al., 2020; Stuckey et al., 2013). One of the media that can be used to improve learning outcomes is the question box media. The question box media is a simple learning media made in the form of a box containing many questions that each group member will take at random and that provides a collection of questions related to the material that has been presented (Andre Suhardiana, 2019; Herpratiwi et al., 2019; Khairunnisa & Surya, 2017; Perwita & Indrawati, 2020). Question box learning media is a media collection of questions related to the subject matter that has been delivered. The information submitted is changed in the form of questions contained in one box. These questions are quizzes in the learning process (Cookson, 2015; Heong et al., 2020; Nilayati et al., 2019). This question box media attracts students' interest in learning and conditions group members to be active and complete assignments. The question box is media with a box shape that can be visible from all directions. This question box media attracts students' interest in learning and conditions group members to be active and complete assignments (Saribas & Ceyhan, 2015; Trotskovsky & Sabag, 2015; Wahyono & Susetyorini, 2021). The question box is media with a box shape that can be visible from all directions. This statement synthesizes that the question box media attracts students' interest in learning and conditions group members to be active and complete assignments (Heong et al., 2020; Monroe et al., 2019). The question box is media with a box shape visible from all directions.

Based on the presentation presented, it is necessary to research the effectiveness of using the talking stick learning model assisted by the question box media on elementary school science learning outcomes. Previous research on the Talking Stick learning model affected students' science learning outcomes (Fajrin, 2018). Previous study reveal that Question Box Media is suitable for application because this model can train students to think critically in solving each problem creatively to achieve learning objectives (Dewi & Widiana, 2020). The application of the talking stick learning model assisted by the question box media is expected to improve the science learning outcomes of elementary school students.

Based on this description, this study aimed to analyze the effectiveness of using the talking stick learning model assisted by the question box media on science learning outcomes in elementary schools.

2. METHODS

This research is quantitative with an experimental study. The talking stick learning method in science learning to determine the effectiveness of applying the learning method in science learning for fifth-grade elementary school students in Purwodadi District, Grobogan Regency. The design with the One-Group Pretest-Posttest Design. The research design used was "One Group Pretest-Posttest Design", which involved only one group without a comparison group. So this research is an experimental study involving samples taken from an experimental group and a control class, namely class V SD Negeri Purwodadi District, Grobogan Regency. The population in this study were fifth-grade students at SD Negeri Nambuhan, totaling 36 students. The sample used was class V, amounting to 30 students. Selection of the sample using simple random sampling. This sampling technique allows each student to become a research sample. Sampling using lottery numbers.

Data collection using observation and test techniques. Data on student participation and activity while participating in the science learning process activities carried out in this study were collected using observation guide sheets. Meanwhile, data on science learning outcomes are based on students implementing a learning achievement test using a written test sheet containing science questions with 15 queries. Indicators of science questions and items are presented in Table 1.

Table 1. Indicators of Natural Science Questions on the Respiratory Organ Systems of Humans and Animals

No	Question Indicator
1	Presented questions in the form of pictures, students can explain the function of the human respiratory organ system.
2	Presented questions, students can explain the process in the human respiratory phase.
3	Presented questions, students can explain the process in the human respiratory phase.
4	Presented questions, students can explain the function of the respiratory organs of animals.
5	Presented pictures and text questions, students can explain the various respiratory organs of animals.
6	Presented a statement text, students can analyze how to maintain organ health
7	human breathing.

The test measures students' ability before and after treatment to determine the method's effectiveness. The test was carried out with two step: the pretest and the posttest. Data analysis techniques used to analyze the data obtained in this study are descriptive statistical analysis techniques and inferential statistical analysis. The research hypothesis test in this study used the SPSS 25 program. The Paired Sample T-Test was tested by comparing the initial test results (Pretest) scores with the final test (posttest).

3. RESULT AND DISCUSSION

Results

Table 2. Description of Pretest Distribution of Student Learning Outcomes on Human and Animal Respiratory Organ Systems

Statistics	Statistical Value
Sample Size	30.00
Maximum Score	85.00
Minimum Score	35.00
Score Range	48.00
Average Score	69.00
Median	70.00
mode	64.00
Standard Deviation	11.76
Variance	138.34

Based on the Pretest, the frequency distribution list is grouped into five categories as show in Table 3.

Table 3. Distribution of Frequency and Percentage of Values of Natural Science Learning Outcomes on the Respiratory Organ Systems of Humans and Animals

Value Interval	Category	Frequency	Percentage (%)
0 – 32	Very low	0	0.00
33 – 64	Low	11	36.66
65 – 76	Currently	10	33.34
77 – 88	Tall	9	30.00
89 – 100	Very high	0	0.00
Amount		**30**	

Based on Table 3, the learning outcomes above, concluding that the learning outcomes obtained by students in the pretest obtained scores in the low category. The results of the Descriptive Statistical Analysis for the posttest results can be described in Table 4.

Table 4. Description of the Posttest Distribution of Student Learning Outcomes on the Respiratory Organ Systems of Humans and Animals

Statistics	Statistical Value
Sample Size	30
Maximum Score	85
Minimum Score	65
Score Range	33
Average Score	85.5
Median	88
mode	80
Standard Deviation	7.8
Variance	61.7

Based on the posttest, the frequency distribution list is grouped into five categories as show in Table 5.

Table 5. Distribution of Frequency and Percentage of Values of Natural Science Learning Outcomes on the Respiratory Organ Systems of Humans and Animals

Value Interval	Category	Frequency	Percentage (%)
0 – 32	Very low	0	0
33 – 64	Low	0	0
65 – 76	Currently	3	10
77 – 88	Tall	18	60
89 – 100	Very high	0	0
Amount		**30**	

Based on Table 5, the learning outcomes obtained by the class, students can conclude that after applying the talking stick learning method with the help of the questions box, it has increased so that the majority of student scores fall into the high category.

Results of Inferential Statistical Analysis

Test the hypothesis using the Independent Sample T-Test, which tests the significance of the difference in the mean (mean) between the 2 data groups, namely the learning outcomes achieved by students in the pretest with the learning outcomes achieved by students in the posttest after being given treatment in learning. In testing the hypothesis of this study used a significant level of 95% or with a value of $\alpha = 0.05$. So, the data to be tested in this hypothesis test is the average value of science learning outcomes achieved by students in the final test (posttest) or after being treated with the talking stick learning model assisted by the question box and the average score of the results learning achieved by students in the initial test (Pretest) without using this method. The average Pretest and Posttest results achieved by students are show in Figure 1.
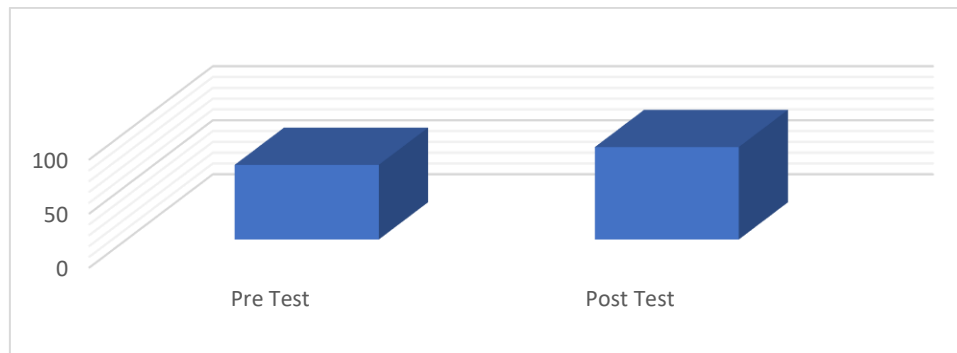
Figure 1. Average Pretest and Posttest Results Achieved by Students in Learning Natural Sciences on Human and Animal Respiratory Organ Systems

The average science learning result in the pretest was 69, while the average science learning result in the posttest was 85.5. The learning outcomes achieved by students from Pretest to posttest increased by 16.5%. Following the statistical data analysis technique used in hypothesis testing (before conducting inferential analysis), a requirements analysis test is performed on the research data obtained. The analysis requirements test referred to is the normality and homogeneity test, described in detail. The data group normality test used the Kolmogorov-Smirnov test with a significant level of $\alpha = 0.05$. This normality test aims to see whether the learning outcomes achieved by students are normally distributed or not. The results of the data analysis Pretest is 0.413, and the post-test is 0.

The output in the Test of Homogeneity of Variances table shows that the resulting significance is 0.191, which is more significant than 0.05 (0.191 > 0.05), then H-0 is accepted. So it can be concluded that the variance of the two data groups, namely the initial test result data group and the final test result data group, are the same or homogeneous. The Sig value knows the output of the Independent Sample T Test. (2-tailed) of 0.000, then H0 is accepted, so it can be concluded that there is an average difference between the pretest and posttest results so that the talking stick learning model assisted by question box media is effectively used in improving science learning outcomes for students.

Discussion

The analysis results show a difference in the average learning outcomes between the pretest and posttest using the talking stick learning model assisted by question box media, effectively used to improve students' science learning outcomes. In learning activities, the application of the talking stick learning model can make students more active in learning, build cooperation between group members, and test students' readiness to master learning material so that students become more active in learning and more active (Murtiningsih, 2013; Pour et al., 2018). Previous study state the application of the talking stick model and audio-visual media significantly influences the thematic learning outcomes of fifth-grade students at SDN 8 Metro Timur (Habibi et al., 2020). Previous research of Model pembelajaran kooperatif tipe talking stick berpengaruh signifikan terhadap hasil belajar IPA siswa kelas V SD Inpres 16 Kabupaten Sorong tahun ajaran 2018/2019 (Hasrudin & Asrul, 2020). Model pembelajaran kolaboratif tipe talking stick berpengaruh terhadap hasil belajar IPA. The effectiveness of using the talking stick learning model assisted by the question box is in line with other studies. Namely, testing encourages students to be more active in learning and encourages students to be brave. The use of talking sticks and question boxes has a significant effect on science learning outcomes.

When combined with learning media, the talking stick learning model will make learning more effective and optimize the applied model. In line with what was stated, learning media can convey messages (learning materials) to stimulate attention, interest, thoughts, and feelings of student learning in learning activities to achieve specific understanding goals. The quality of education will not be optimal if it is not supported by learning media as an intermediary, making it easier to explain a subject matter. The talking stick learning model can provide opportunities for students to explore knowledge and good ideas within themselves. The advantage of applying the talking stick learning model in the learning process: it creates motivation and enthusiasm for students to participate in learning. It creates challenges for students so all group members can express their opinions or ideas (Effendi & Hartati, 2018; Pane & Dasopang, 2017). The talking stick model is a strategy that can spur students to understand the material carefully and be ready physically and mentally during the teaching and learning process in class to improve students' abilities.

The influencing factor is the increase in student learning motivation after using a new learning model because learning is fun. This is consistent with other research that the talking stick learning model

can increase motivation so that student learning outcomes increase because learning is fun and trains students' readiness to accept learning so that students are involved in answering questions (Arianti et al., 2019; Megita Rani et al., 2019; Pour et al., 2018). The use of question boxes in the classroom learning process must involve all students' potential and abilities optimally and reduce student dependence on teachers so that students are independent and reduce teacher centres (Asmara et al., 2014; Ayuni et al., 2017). The learning motivation of the two classes after treatment showed differences. Implementing continuous learning shows effectiveness, and teacher questions should increase student motivation. Following problem-solving, they can activate their critical thinking and predict logical ways to solve problems (Ayuni et al., 2017; Trianti Lestari et al., 2018). Their problem-solving can improve critical thinking and predict analytic problem-solving methods (Lee et al., 2021; Lemos & Veríssimo, 2014; Malekian et al., 2013). The use of the selected media is the next factor.

The implications of this study provide an overview that learning media helps the learning process so that students understand learning material easily, overcoming the limitations of space and time. The media question box involves students' emotional and intellectual conditions and makes it easy to share questions. Motivation is evident, suggesting that students' extrinsic motivation impairs (and may even cooperate with) intrinsic interest and academic achievement. The limitations of the study only involved students in one school. Therefore, future research is expected to be able to further deepen and expand research related to the talking stick learning model assisted.

4. CONCLUSION

Based on the results of the analysis of the talking stick learning model assisted by question box media on science learning outcomes in elementary schools, especially the human and animal respiratory organ systems, it is effectively used in improving student science learning outcomes. This research shows that teachers can apply learning models to develop learning outcomes and student activities in class because they have implications for the use of learning media in class so that students are more motivated and active in the learning process. But the teacher still pays attention to the model, method and strategy.

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