



The Effectiveness of the Song-Assisted Discovery Learning Model on Science Learning Outcomes at Sragen 06 State Elementary School

Putri Sih Fanta Wati ^{*)} & Putri Yanuarita Sutikno
Universitas Negeri Semarang, Indonesia

Abstract

This study aims to test the effectiveness of the song-assisted Discovery Learning learning model for science students' learning outcomes.

This happened because students still needed clarification about sorting digestive organs. This study uses an experimental method with a quantitative approach. The population of this study is grade V students of Sragen 6 State Elementary School, Sragen Regency, with a total of 62 students. Sampling was conducted with saturated samples, with 25 V-A students as the control class, 25 V-B students as the experimental class, and 12 as the instrument trial. The data collection techniques used are written tests, observations, and documentation. Data analysis techniques using prerequisite tests include instrument validity and reliability, initial data analysis with normality and homogeneity tests, and final data analysis using t-test and n-gain test. The study results showed a positive effectiveness of using the discovery learning model with an increase in the learning outcomes of grade V students; the calculation value was more significant than the table ($3,767 > 2,012$). H_0 is rejected, and H_a is accepted, meaning there is a difference in learning outcomes between the pretest and posttest in learning using the Discovery Learning learning model. Based on the above analysis, the posttest results show that the learning outcomes between the experimental class are higher than those of the control class. The difference is due to the treatment difference between the experimental and control classes. This study concludes that the discovery learning learning model effectively improves the learning outcomes of grade V students of Sragen 6 State Elementary School. The suggestion for this study is that teachers need to apply the discovery learning model as one of the innovative learning models to improve student learning outcomes.

Keywords: Learning Outcomes, Science, Discovery Learning Model

(*) Corresponding Author: putrifanta26@gmail.com

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INTRODUCTION

Education is an effort made by the government to improve the quality of human resources, making it a vital aspect of the development of a nation. As outlined in Law No. 20 of 2003 concerning the National Education System, education is a conscious and planned effort to create a learning atmosphere and learning process that allows students to develop their potential actively, have spiritual strength, self-control, personality, intelligence, noble morals, and skills needed by themselves, society, nation, and state. One of the main subjects included in this law, one of which is Science. Permendiknas No. 22 of 2006 explains that science is a science that explicitly studies aspects of nature and its changes. The purpose of learning science in elementary school is to develop piety to God through appreciation for His creation, understanding the idea of science, fostering a positive attitude and curiosity about the relationship between science, the environment, technology,

and society, learning to explore the natural environment, increasing awareness of environmental conservation, and realizing the order of nature as God's creation.

The OECD (Organization for Economic Co-operation and Development) three-year survey of 15-year-olds around the world, presented in PISA (Program for International Student Assessment) scores, shows that Indonesia is still among the low-yielding countries in 2023. In the science category, Indonesia is ranked 67th out of 81 countries with a score of 389. These results reflect the conditions in the field, where there are still many problems in developing primary science education in Indonesia. Based on interviews with grade V teachers at Sragen 6 State Elementary School, researchers found problems in science learning, especially in the material on Human Digestive Organs. These problems include the need for more use of media that appeals to students and the limitation of learning resources consisting only of student and teacher books, worksheets, and display images. In addition, students' curiosity needs to be improved, as seen by only five students who actively answered oral questions from the teacher. Teachers' learning methods and models, such as discussions, assignments, and questions and answers, are still conventional. Mastering science material and learning outcomes could be more optimal, with student scores in the Mid-Semester Assessment (PTS) still below the Learning Objectives Completeness Criteria (KKTP) 75. Of the 62 students in grades V, A, and VB, 35 (56%) did not meet the KKTP, while 27 (44%) met the KKTP.

Based on the results of observations and interviews with classroom teachers, this is due to students' curiosity that still needs to be improved. Students' curiosity in science learning is a natural motivation to understand scientific phenomena, ask questions, and seek answers through exploration and investigation. This encourages students to actively participate in the learning process, participate in discussions, conduct experiments, and develop critical thinking skills. This curiosity is essential to help students internalize scientific concepts and apply them in their daily lives so that they become independent and critical learners. This can have an impact on student learning outcomes. Student learning outcomes are interpreted as changes in circumstances in a positive direction after the learning process (Anjarwani, 2023; Rudiyanto, 2019).

The learning outcomes of students in science learning can be optimal if supported by appropriate media. Learning media is a means that includes all the resources needed to communicate in the learning process. Teachers can use media to stimulate students' ideas and interest in learning so that students acquire new attitudes, knowledge, and skills by the expected goals (Arsyad, 2017; Wibawanto, 2017). Learning songs have an interrelated function in increasing the effectiveness of the teaching and learning process (Benedict, 2021; Gao, 2020; Lesser, 2019). Effectiveness is the success or efficacy of an action, method, or tool in achieving the desired goal. In the learning process, effectiveness refers to how well a teaching strategy or method helps students understand, remember, and apply the knowledge taught and achieve the desired learning outcomes. If a learning method is said to be effective, it means that it has succeeded in reaching the educational goals that have been set efficiently and satisfactorily. Learning songs also have a similar role in this regard. With catchy melodies and memorable lyrics, learning songs can motivate students to learn more enthusiastically (Karabulatova, 2021; Luo, 2019; Ma, 2020). In addition, teaching media helps improve students' understanding of the subject matter through clear visualizations and presentations. Learning songs also helps by simplifying complex concepts into lyrics that are easy to understand and memorize. Learning media that engages multiple senses can help students remember material longer, and learning songs, with repetition and rhythm, can help students remember important information more easily. Thus, using learning media and songs together can create a more effective and fun learning environment (Kim, 2019; Vishnevskaja, 2019). The functions of learning songs are: 1) Attracting and directing students' attention so that they can focus on the subject matter

presented (Baills, 2021; Ristanto, 2020); 2) Creating a fun learning experience when the song is sung and making it easier for students to learn or read pictorial texts (Jamshidi, 2021; Yomaki, 2023); 3) Understanding and reminding data or messages in learning materials through songs (Jauza, 2024); 4) Helps organize text information into more memorable forms (Kamaluddin, 2019; Rokhim, 2023; Sulistyanto, 2023).

Media use can be optimal if the learning model is the right one. The discovery learning model was chosen in this study because of the problem of the need for a model that increases student activities. Discovery Learning is a learning model in which students actively discover and understand concepts through independent exploration and discovery with minimal guidance from the teacher. This method stimulates students' curiosity, encouraging them to ask questions, seek information, and conduct experiments (Kamaluddin, 2019; Syawaludin, 2022; Sulistyanto, 2023). Curiosity plays a vital role in Discovery Learning because it encourages students to be more involved in learning, more motivated to understand the material in-depth, and develop critical and independent thinking skills to improve learning outcomes.

The research that supports solving this problem is a study by Winarni (2020) entitled "Analysis of Language and Scientific Literacy Skills for 4th Grade Elementary School Students Through Discovery Learning And Ict Media". The study's findings show that discovery learning with technology-based learning media significantly impacts students' language and science literacy. By applying the Discovery Learning model, students are actively involved in discovering and understanding concepts and using different types of technology in the learning process. Integrating technology-based learning media allows students to access information more widely, making learning more exciting and relevant to the current technological context. Thus, discovery learning with technology-based learning media improves students' understanding of language and science literacy and enriches their learning experience through active exploration and utilization of modern technology.

The pre-research findings in April 2024 show several problems that must be addressed immediately so they do not recur because they will hurt students' learning processes and outcomes. Researchers must address emerging issues, especially those that lack an effective learning process that impacts learning outcomes, lack of variety and innovation of learning media, and students' curiosity when receiving learning materials. To obtain valid and accountable results through objective evidence, researchers must adhere to three essential principles, according to field conditions, and be valuable when conducting research. Therefore, researchers need to apply these three principles by conducting direct observation and research in the elementary school concerned. This study aims to test the effectiveness of the song-assisted Discovery Learning model on students' science learning outcomes. Songs in the survey are part of the learning model used.

METHODS

This study uses a quantitative approach, randomly selecting a population or sample. Data is collected through research instruments, and statistical analysis tests predetermined hypotheses. The research method applied in this study is an experimental method used to explore the effect of specific treatments on other variables under controlled conditions. The research design used was a nonequivalent control group design. Two groups were compared; one group received special treatment while the other did not (Sugiyono, 2019). Before the administration, both groups were tested with tests to assess each other's initial condition and the changes after the treatment. The treatment given to the

control group was a conventional learning model with book media, and the treatment in the experimental group was a discovery learning model with song media.

The population of this study is grade V students of Sragen 6 State Elementary School, Sragen Regency, with a total of 62 students. Sampling was carried out with saturated samples. The control class, namely class V-A of Sragen 6 State Elementary School, totaled 31 students, and the Experimental Class, namely class V-B of Sragen State Elementary School 6, totaled 31 students. The research was conducted in the April-June 2024 period. The control group and the experimental group conducted two learnings, namely learning with the topic "Understanding and Digestive Organs in Humans" and the topic "Supporting Glands of the Digestive Organ System in Humans." The data collection techniques used are written tests, observations, and documentation. Data analysis techniques include prerequisite tests such as instrument validity and reliability, initial data analysis through normality and homogeneity tests, and final data analysis using t-tests and n-gain tests.

RESULTS & DISCUSSION

Results

This study aims to test the effectiveness of the song-assisted Discovery Learning model on the learning outcomes of science students. The samples were formed into a control group (class V A) and an experimental group (class V B). The control group and the experimental group conducted two learnings, namely learning with the topic "Understanding and Digestive Organs in Humans" and the topic "Supporting Glands of the Digestive Organ System in Humans." The experimental group was treated with a discovery learning model using songs about digestive organs as a medium. Meanwhile, a conventional learning model with package book media is needed in the control group. Songs used with links: <https://youtu.be/0a6YX5O4uTA?feature=shared>

Lyrics of the song of the digestive organs in humans

*Let us all learn about the digestive system
In humans, from mouth to anus 2x
Food enters the mouth and is chewed by the teeth
Chemical mechanical digestion occurs 2x
Then, in the esophagus, there is peristaltic movement
Push into the stomach with three kinds of enzymes
Pepsin enzyme, renin enzyme, and hydrochloric acid enzyme
Digestion in the stomach chemically 2x
Continuing to enter the small intestine, absorption occurs
Food essence is needed by the body 2x
The colon absorbs water until it leaves pulp
Pulp is constantly excreted through the anus
That is digestion in the human body
It must be known by all of us 2x
Do not forget to maintain a healthy lifestyle
So that we avoid dangerous pain 2x
Our digestive system must be maintained
As a form of gratitude to the One God*

Song media display

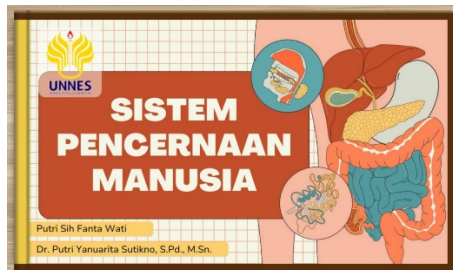


Figure 1. Material Display

Source:

<http://online.anyflip.com/ictry/defm/>



Figure 2. Song

Source:

<http://online.anyflip.com/ictry/defm/>

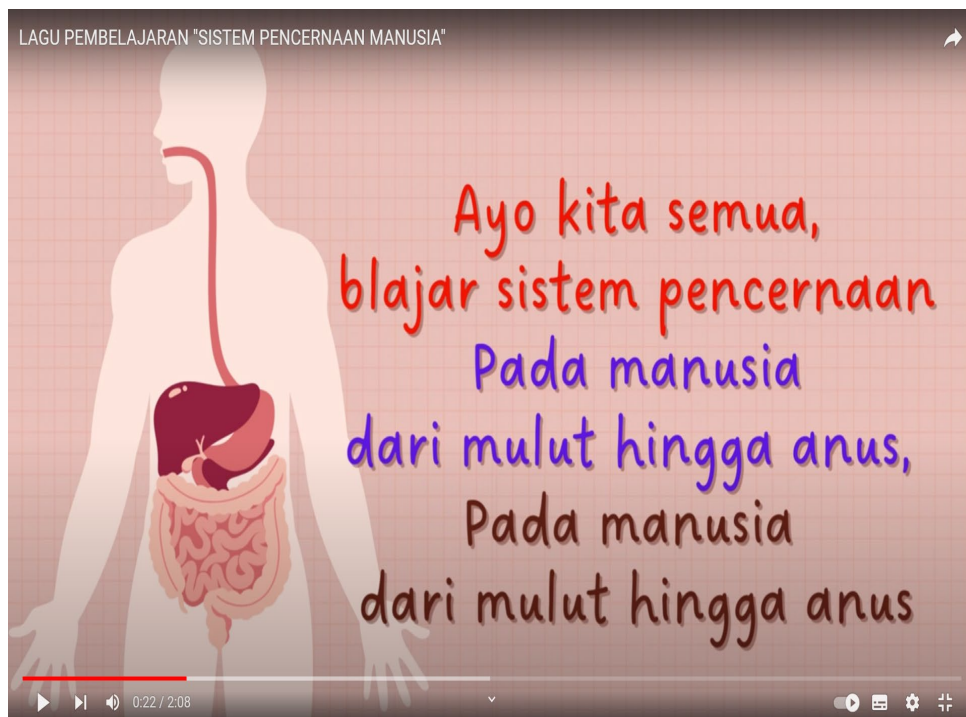


Figure 3. Human Digestive Organ Song Media

Source: <https://youtu.be/0a6YX5O4uTA?feature=shared>

The Discovery Learning model is carried out with the following syntax: 1) Stimulation (The teacher sings with students about the digestive organs by playing a song about the human digestive organs to attract attention and spark students' enthusiasm); 2) Problem Statement (The teacher asks a guide question, "How is food digested in our body?" to stimulate students' thinking); 3) Data Collection (Students use the medium of songs to collect information about the function and interaction of digestive organs); 4) Data Processing (Students discuss information in groups and make a concept map of food digestion); 5) Verification (Students verify information by comparing the results of the discussion with song lyrics and teachers' explanations); 6) Generalization (Students draw conclusions about the digestive process and present their findings to the class).

The Conventional Model is carried out with the following learning steps: 1) Teacher Instruction (The teacher explains the human digestive organs using songs as an

audio aid); 2) Independent Reading (Students read the material independently and take note of important points and questions); 3) Group Discussion (Students discuss in small groups to discuss the information they read); 4) Group Presentation (Each group presented the results of their discussion about the digestive process); and 5) Practice Questions (Students work on practice questions to measure their understanding of the digestive organs).

Each group was given a pretest and a posttest with a written test in the form of a description that had been tested for validity and reliability. Testing the validity of the instrument in this study using the biserial point correlation formula, ten questions met the valid criteria that will be used for the next stage in the control group (class V A as many as 25 students) and the experimental group (class V B as many as 25 students). The reliability test results with the KR-20 formula using MS Excel software obtained a correlation coefficient (r) of 0.93, included in the very fixed/good criteria.

The initial data analysis in this study used normality and homogeneity tests. The normality test of learning outcomes was carried out as a prerequisite for data analysis through parametric statistics. The normality test aims to determine whether the data distribution follows or approaches the normal distribution. (Santoso, 2018) The results of the data normality test with SPSS can be seen in Table 1.

Table 1. Normality Test

Group	Valuation	Sig Value.	Information
Control	Pretest	0,073	> 0.05
	Posttest	0,152	> 0.05
Experiment	Pretest	0,200	> 0.05
	Posttest	0,200	> 0.05

Results of calculation Table 1. The pretest and posttest data in the control and experimental groups had a significant value greater than 0.05, so it can be concluded that the pretest and posttest data are typically distributed.

The homogeneity test determines whether the two samples have the same variance. The formula used in this homogeneity test is the Levene test. Homogeneity Test Results in table 2.

Table 2. Pretest Homogeneity Test Results

Homogeneity	Sig Value.	Information
Learning 1	0,38	> 0.05
Learning 2	0,33	> 0.05

It can be described in Table 2. The pretest data of the control and experimental groups in learning 1 and 2 had a SIG value of 0.38 and 0.33 or greater than 0.05, so the data was homogeneous and could be tested further. A paired t-test was used to test students' initial ability in the experimental and control classes before being given different treatments—the hypothesis in this study.

H0= There was no difference in the average of the control group and the experimental group

Ha= There was a difference in the average of the control and experimental groups.

The testing criteria are as follows:

- The significance value or probability value < 0.05 is an average difference.
- If the significance or probability value is \geq 0.05, then there is no difference in the average.

The results of the T-Test data pretest are in Table 3.

Table 3. Results of the T-Test Average Equation Test

Test T	Sig Value.	Information
Learning 1	0,246	> 0.05
Learning 2	0,715	> 0.05

It can be described in table 3. The pretest data of the control group and the learning experiments 1 and 2 have a GIS value of 0.246 and 0.715 or greater than 0.05, so the pretest data of the control group and the experiment have no average difference, so the data have an average equation.

The final data analysis used the Average Difference test (T-test) and the N-Gain test—the results of the T-test on post-test data are in Table 4.

Table 4. T Test Results

Test T	Sig Value.	Information
Learning 1	0,000	< 0.05
Learning 2	0,002	< 0.05

It can be described from table 4. The posttest data of the control group and learning experiments 1 and 2 have a sig value of 0.000 and 0.000 or less than 0.05, so the posttest data of the control group and the experiment have an average difference. Meanwhile, *the gain data* was used to determine the improvement of students' abilities between the control group that was given conventional treatment and the experimental group that was given the learning treatment of the discovery learning model with song media (Lestari & Yudhanegara, 2018). Based on the formula above, the results of the n-gain test are obtained in Table 5.

Table 5. Results of *N-gain Test Analysis*

Group	Learning	Learning		N Gain	Criterion
		Pretest	Posttest		
Control	Learning 1	19,60	29,16	0,48	Keep
	Learning 2	21,64	31,16	0,52	Keep
Experiment	Learning 1	18,20	34,16	0,72	Tall
	Learning 2	21,20	35,48	0,75	Tall

Based on the calculation of Table 5, it is known that *the N-gain* in the control group test in learning 1 and 2 is 0.48 and 0.52 or included in the medium criteria. Meanwhile, *the N-gain* in learning experiment groups 1 and 2 was 0.72 and 0.75 or included in the high criteria. These results mean that the improvement of student learning outcomes in science learning in the experimental group has a higher score than the control group. This is due to the provision of *a song-assisted* discovery learning learning model.

Discussion

The data obtained from the descriptions of the test results showed significant differences between the control and experimental groups regarding student involvement and understanding of science learning materials. The control group observed using books, while the experimental group used songs as a medium.

The level of students' attention to science subject matter shows that the learning methods or media used do not affect their attention too much. However, the discovery learning model and interactive songs can increase students' motivation and help them stay focused throughout the lesson (Azainil, 2019; Rihayati et al., 2021). Catchy songs can also increase student engagement and enthusiasm. These songs facilitate understanding concepts through lyrics that explain the function of the digestive organs, creating a multisensory learning experience that strengthens students' understanding (Ma, 2020; Wong, 2021).

Using songs in discovery learning encourages students to be more proactive in asking questions and exploring material that has not yet been understood. Students in the experimental group tended to ask the teacher more often (Elhefni, 2020; Hendri, 2019; Huang, 2021). Nonetheless, students in the experimental group may need more guidance in appropriately following observation or experimental procedures. The discovery learning model encourages independent exploration, but this needs to be balanced with clear guidance to keep students on track (Aisah, 2019; Kumala, 2023; Lena, 2019).

In addition, using interactive songs increases students' active involvement in observation and experimentation, making learning activities more engaging and enjoyable (Maladerita, 2024). A learning model that supports group discussions and collaboration allows students to discuss and share their understanding with their peers (Zainal, 2023). However, while songs provide easy-to-remember information, there is a need for more resources or encouragement for self-exploration beyond the lyrics of the existing songs (Anjarwani, 2023; 2022). Overall, songs make learning more effective, interactive, and fun and develop students' critical thinking skills and learning outcomes.

The control group observed using books, while the experimental group used songs as a medium. This reflects that the song press is more effective in attracting attention and motivating students to be more active in learning. With its interactive features, the song media offers a more dynamic learning experience than observation using static books. This may explain why the experimental group showed a higher increase in engagement and understanding. These data show that using song-assisted discovery learning models increases student engagement and improves their knowledge of science subject matter. However, some require further attention, such as paying attention to the observation steps and summarizing the observations, to ensure that all aspects of learning are reinforced thoroughly.

Discovery learning encourages students to actively learn by discovering concepts and knowledge through independent exploration and discovery. In this context, teaching media provides interactive and engaging visual tools, which make it easy for students to visualize the digestive process gradually, from the mouth to the anus, with detailed illustrations and explanations (Ghozali, 2020; Supiarza, 2021; Toleuzhan, 2022). When combined with songs about digestive organs, the media provides a multisensory approach to learning. The song makes the learning atmosphere more enjoyable and helps students memorize and understand the function of each organ through easy-to-remember lyrics.

Using songs about digestive organs in the discovery learning model can significantly improve student learning outcomes in science subjects. Songs with lyrics that contain digestive concepts can help students remember and understand the material in a fun and memorable way. When combined with discovery learning, where students actively explore and discover concepts through practical activities such as experimentation and observation, their understanding becomes more profound and more meaningful (Ma, 2020). This integration improves information retention and develops critical thinking and analytical skills so that students can better apply their knowledge in real-life situations, ultimately improving their learning outcomes in science.

CONCLUSION

It can be concluded that the pretest data of the control group and the experiment in learning 1 and 2 have significance values of 0.246 and 0.715, respectively, which is greater than 0.05. This shows no mean difference between the control group and the experiment in the pretest data, so the data has the same mean. Meanwhile, the posttest data of the control group and the experiment in learning 1 and 2 had a significance value of 0.000, more diminutive than 0.05. This shows a mean difference between the control group and the experiment in the post-test data. Based on the calculations, it is known that the N-gain in the control group test in learning 1 and 2 is 0.48 and 0.52, which is included in the moderate criteria. Meanwhile, the N-gain in learning experiment groups 1 and 2 was 0.72 and 0.75, which were included in the high criteria. These results show that the improvement of student learning outcomes in science learning in the experimental group is higher than in the control group. This increase is due to applying the discovery learning learning model supported by learning songs.

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