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# The Effectiveness of the Discovery Learning Model Supported by the Assemblr Edu Platform on Student Activeness

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**A B S T R A C T**

This study was motivated by the low level of Learning Activeness among fifth-grade students at SDN Kahiyangan regarding the human respiratory system due to the limited use of learning hmodels and instructional media. This study aims to examine the effect of the Discovery Learning model supported by the Assemblr Edu platform on students Learning Activeness. The novelty of this study lies in the integration of the Discovery Learning model with Assemblr Edu media to enhance students' learning activeness in the human respiratory system topic; previous studies generally examined these two variables separately. This study employed a quantitative method using a pre-experimental model and a one-group pretest-posttest design involving 20 students, with purposive sampling used as the sampling technique. The data analysis used was the Wilcoxon signed-rank test. The results showed a significance value of 0.000 (0.000 < 0.05), while the N-Gain score was 0.3429, indicating moderate effectiveness. The use of the Assemblr Edu platform to support the Discovery Learning model helps visualize abstract concepts related to the human respiratory system through three-dimensional objects. Based on the research results, it can be concluded that the Discovery Learning model supported by the Assemblr Edu platform is effective in improving students Learning Activeness.

## 1. Introduction

Learning is a process that fosters interaction between teachers and students to achieve the goals of education (Darman, 2020) . Students are required to actively engage in the learning process, and teachers must encourage students to participate in every aspect of the learning process. In line with the concept of "(Rikawati & Sitinjak, 2020) , students are at the center of every learning activity, playing an active role throughout the process to understand the material through both physical and mental activities. Every student has their own potential, and teachers need to encourage students to make the most of their potential. Active learning is one of the

key factors determining success in the learning process. Student engagement can be demonstrated through their willingness to ask questions, answer the teacher's questions, express their opinions, ideas, and thoughts, or participate in activities that support the achievement of learning objectives. Therefore, teachers need to create learning experiences that encourage students to be more active during instructional activities.

Based on real world conditions in the classroom, Evitasari & Aulia,(2022) , in their research, noted that learning is still dominated by teacher-centered activities, particularly in science education. During learning activities, the teacher serves as the primary source of knowledge, so students tend to passively receive information without being given the opportunity to explore. Instruction still relies heavily on teacher's manuals or student textbooks, and there is a lack of variety in teaching methods and the use of interactive learning media that could encourage student engagement. This results in low levels of student engagement, as evidenced by students' passivity during learning activities. This lack of engagement is also evident in students who merely listen to the teacher's explanations and take notes without participating in any activities that involve them.

Low levels of student engagement were also observed at SDN Kahiyangan. Based on initial observations conducted in the fifth-grade class at SDN Kahiyangan, it was found that some students remained relatively inactive during lessons. This was evident in students' tendency to be passive during instruction particularly when the teacher asked questions related to the material being studied with some students remaining silent without attempting to answer the teacher's questions. When the teacher gave students the opportunity to ask questions, they remained silent and lacked the courage to ask questions or offer responses, nor did they demonstrate optimal participation in discussion activities. These conditions made the learning process less effective and hindered the achievement of learning objectives. Therefore, student engagement is crucial in the learning process; students who are actively involved in learning activities will have a better understanding of the material being studied.

Active learning is a learning activity in which students are encouraged to actively participate and engage in every stage of the learning process(Kanza et al., 2020) In learning activities, students are required to actively engage throughout the learning process by exploring and understanding concepts from the material, solving problems, and applying the knowledge they have gained from their teachers (Septiawati et al., 2022) . Student engagement during the learning process also aims to help develop their inherent potential. According to Susilawati & Jannah, (2019) , active students can be identified by their enthusiasm and strong desire to participate in every stage of the learning process. This is evident through students' direct involvement during lessons, whether by paying attention to the teacher's explanations, actively participating in discussions, or completing assignments given by the teacher.

Given the gap between ideal learning particularly in science education and the actual conditions in the classroom, according to (Prasetyo & Abduh, 2021)there is

a need for instructional strategies that utilize learning models capable of assisting teachers in enhancing student engagement and improving the quality of learning. These strategies should facilitate activities that encourage students to be active during instruction such as exploring, searching, and observing to achieve ideal learning outcomes. Based on previous research conducted by Sispariyanto et al. (2019) , which states that the Discovery Learning model can increase student Learning Activeness; this increase occurs because in the Discovery Learning model, students are guided to explore science concepts through its syntax, so that these activities can help increase student Learning Activeness, as demonstrated by students who participate in seeking information, thereby enabling them to construct their own knowledge. the Discovery Learning model can further optimize student engagement because it is rooted in constructivist theory (Bruner, 1961; Suriadi et al., 2025). This theory emphasizes that student learning is more effective when students discover concepts on their own through exploration, experimentation, and reflection on phenomena around them. Therefore, the Discovery Learning model is one of the models suitable for application in science education to engage students and keep them active during the learning process. Learning media also play a key role in supporting teachers in enhancing student engagement (Prayoga et al., 2025) . Prayoga also argues in his research that Assemblr Edu is a learning medium capable of creating interactive learning experiences. Through Assemblr Edu, teachers or students can create interactive objects.

To increase student engagement, innovative learning media are needed that can support conceptual understanding and encourage students to actively participate during the learning process (Rochmah et al., 2025) . Assemblr Edu is an interactive, augmented reality-based digital learning tool that helps teachers visualize learning materials more realistically through 3D images and explains abstract concepts, making it easier for students to understand the taught material. Through Assemblr Edu, students can explore and interact with learning objects. Assemblr Edu makes abstract learning concepts easier for students to understand.

Previous research has shown that the implementation of the Discovery Learning model has a positive impact on student engagement. A study by Faan et al. (2021) indicates that the Discovery Learning model can increase student engagement in learning. This is evidenced by an increase in the average student engagement score before and after the Discovery Learning model was implemented. Another study by Rachim et al. (2024) found that learning that integrates augmented reality-based learning media can increase student Learning Activeness through the visual presentation of information in a physical environment, thereby making it easier for students to understand abstract concepts in learning. Research on the application of the Discovery Learning model supported by Augmented Reality-based Assemblr Edu learning media on student Learning Activeness is still limited; few studies have examined the integration of the Discovery Learning model supported by Assemblr Edu media with student Learning Activeness. Therefore, this study was conducted to examine the effect of the Discovery Learning model supported by Assemblr Edu media on student Learning Activeness. The integration of technology into learning is expected to serve as an innovation that can assist teachers in achieving ideal learning outcomes.

Based on the description above, this study aims to examine the use of the Discovery Learning model supported by Assemblr Edu media in teaching the human respiratory system and its effect on student Learning Activeness. This study is also expected to contribute to teachers' efforts to develop more innovative and effective teaching and learning processes, as well as provide insights for teachers in selecting instructional models and methods for integrating technology into the classroom as a learning tool that can assist both teachers and students in the learning process and enhance students' Learning Activeness. Therefore, the results of this study are expected to serve as a reference for developing instruction at the elementary school level.

## 2. Methodology

This study employed a quantitative research design using a *pre-experimental* method. It utilized *a one-group pre-test post-test* design, which allows for the measurement of outcomes before and after the intervention. This study was conducted at an elementary school in Kuningan Regency. The sampling technique used was purposive sampling, which involves selecting a sample based on specific criteria (Sugiyono, 2017) . The sample consisted of 20 fifth-grade students selected because they met the study's criteria. This study employed a data collection technique involving a pretest administered before the intervention, followed by a posttest administered after the intervention to determine the changes observed in the students.

The implementation of the Discovery Learning model aided by the Assemblr Edu platform took place during a single class session on the human respiratory system. The use of the Discovery Learning model aided by Assemblr Edu was carried out in six stages, beginning with the stimulation stage, in which the teacher displayed images of human organs using the Assemblr Edu platform to capture students' attention and posed prompting questions related to the images; students then answered the prompting questions posed by the teacher. The second stage is the problem statement stage, in which the teacher guides students to identify issues related to human respiratory organs and mechanisms based on their observations of the images. Students then express their opinions, formulate questions, and define the problems to be investigated.

The next stage is data collection; during this stage, the teacher distributes the worksheets and provides guidance on using the Assemblr Edu platform. Students work in groups to observe three-dimensional (3D) objects on the Assemblr Edu platform and gather the information obtained to complete the worksheets. During the data processing stage, the teacher facilitates the group discussions. Students process the information, discuss their observations, and formulate answers based on the information obtained in the section of the worksheets according to the instructions. Next is the verification stage, during which students present the results of their group discussions; other groups then provide feedback, and the teacher confirms the discussion outcomes. In the generalization stage, students and the teacher jointly formulate conclusions regarding the human respiratory organs,

functions, and mechanisms based on the learning activities that have been conducted.

This study used an observation sheet to measure the implementation of the Discovery Learning model aided by the validated Assemblr Edu platform. The validity of the instrument was assessed through expert judgment by two experts with expertise in science education. The validators evaluated the instrument's alignment with the research indicators, clarity of language, and appropriateness of content. Based on the validation results, the instrument was deemed suitable for use after revisions were made in accordance with the validators' recommendations. The expert validation results indicated that the instrument met the criteria for content, construct, and language validity, thereby making it suitable for use in this study. This study also used a student learning activity questionnaire in the form of a Likert scale, consisting of 15 statements used to measure student learning activity. The questionnaire was developed based on indicators of learning activity according to (Sudjana, 2016; Ernia & Wahyudi, 2023) . The questionnaire item outline is presented in Table 1.

Table 1. Questionnaire Outline for Student Learning Activeness

| No. | Indicator | Distribution of Question Items | | Number |
|---|---|---|---|---|
| | | Positive | Negative | |
| 1 | Students actively participate in their learning tasks | 1.2 | | 2 |
| 2 | Students are involved in problem-solving during learning activities | | 3 | 1 |
| 3 | Students ask their peers or the teacher when they do not understand the material | 4,5 | | 2 |
| 4 | Students try to find information that may be needed to solve problems | 6.7 | 8 | 3 |
| 5 | Students engage in group discussions according to the teacher's instructions | 9,11 | 10 | 3 |
| 6 | Students are able to assess their own abilities and the results they have achieved | 12 | | 1 |
| 7 | Students practice solving problems | 13 | 14 | 2 |
| 8 | Students have the opportunity to use or apply what they have learned to complete the tasks or solve the problems they face | 15 | | 1 |

This study aims to determine students' Learning Activeness using a questionnaire. Before implementing the Discovery Learning model aided by the Assemblr Edu platform, students were given a pretest questionnaire to assess their initial level of Learning Activeness. Subsequently, students were exposed to the Discovery Learning model aided by Assemblr Edu, and a posttest questionnaire was administered to assess changes in their level of Learning Activeness after participating in the learning process. The data analysis technique used in this study was the Wilcoxon signed-rank test as a hypothesis test to determine whether there

was an increase in students' Learning Activeness following the implementation of the Discovery Learning model supported by the Assemblr Edu platform.

## 3. Results and Discussion

This study aims to determine the effectiveness of the Discovery Learning model supported by Assemblr Edu on the Learning Activeness of fifth-grade students at SDN Kahiyangan. Data on Learning Activeness were collected using questionnaires administered before (pretest) and after (posttest) the intervention, which involved implementing the Discovery Learning model supported by Assemblr Edu. Instruction in this study was conducted using the Discovery Learning model supported by Assemblr Edu on the topic of the human respiratory system. The learning process was carried out in accordance with the stages of the Discovery Learning model, beginning with the stimulation stage, in which the teacher displayed images of human body organs via the Assemblr Edu platform as an initial stimulus to spark students' curiosity and posed leading questions regarding the images of human body organs. In the problem statement stage, students identified problems and formulated questions regarding the organs, functions, and mechanisms of human respiration based on their observations of the images of human body organs. Next is the data collection stage, where students work in groups to gather information using Assemblr Edu by observing three-dimensional objects as a basis for completing the worksheets. Then comes the data processing stage, during which students and their groups process the information obtained and discuss it together to complete the worksheets. In the verification stage, students will present the results of their discussions, and other groups will provide feedback; the teacher will then confirm the results of the students' presentations. The final stage is generalization, in which students, together with the teacher, draw conclusions regarding the organs, functions, and mechanisms of human respiration based on the results of the learning activities.

Data analysis was conducted using descriptive analysis to determine the mean pre-test and post-test scores for student Learning Activeness, along with the Wilcoxon signed-rank test, since the data were obtained from a Likert-scale questionnaire, which falls under ordinal data. The Wilcoxon test is a nonparametric statistical technique used to detect differences between two paired data sets without requiring the assumption of a normal distribution. The differences in students' pre-test and post-test mean scores can be seen in Table 2.

Table 2. Descriptive statistical analysis of student Learning Activeness

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|---|
| Pretest | 20 | 53.00 | 88.00 | 66.5000 | 8.10783 |
| Posttest | 20 | 76.00 | 96.00 | 84.9000 | 6.83566 |
| Valid N (listwise) | 20 | | | | |

Based on Table 1, the descriptive statistics show that the minimum student score on the pretest was 53, and the maximum score was 88, with a mean of 66.5 and a standard deviation of 8.10. After the students were taught using the Discovery Learning model supported by the Assemblr Edu platform, the posttest results showed a minimum student score of 76 and a maximum score of 96, with a mean of 84.9 and a standard deviation of 6.83. Descriptive analysis was also conducted to determine the average scores for each indicator of Learning Activeness. The average score for each indicator was obtained by calculating the sum of the scores for that indicator for each respondent, based on the total number of items in that indicator. The average score for each indicator was calculated using the mean (AVERAGE) function applied to the indicator scores of all respondents in the pretest and posttest data. The average scores for the learning activity indicators are shown in Table 3.

Table 3. Learning Activeness scores for each indicator

| Indicator | Pretest Average | Posttest Average |
|---|---|---|
| Students actively participate in their learning tasks | 6.15 | 7.25 |
| Students were involved in problem-solving during learning activities | 2.55 | 3.2 |
| Students ask their peers or the teacher when they do not understand the material | 5.25 | 7 |
| Students try to find information needed to solve problems | 6.9 | 9.4 |
| Students engage in group discussions according to the teacher's instructions | 8.29 | 10.4 |
| Students are able to assess their own abilities and the results they have achieved | 1.6 | 3.25 |
| Students practice solving problems or questions | 6.15 | 7.25 |
| Students have the opportunity to use or apply what they have learned to complete tasks or solve problems they encounter | 2.75 | 3.4 |

Based on the analysis of the average scores for each indicator of Learning Activeness, all indicators showed an increase following the implementation of the Discovery Learning model aided by the Assemblr Edu platform. This increase indicates that the implemented learning approach not only enhanced overall Learning Activeness but also improved every aspect of student Learning Activeness. To determine whether the increase in student Learning Activeness was statistically significant, a Wilcoxon signed-rank test was conducted. The results of the test are presented in Table 4.

Table 4. Wilcoxon Signed-Rank Test

**Ranks**

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Post-test - Pre-test | Negative Ranks | 0[a] | .00 | .00 |
| | Positive Ranks | 20[b] | 10.50 | 210.00 |
| | Ties | 0[c] | | |
| | Total | 20 | | |

a. Post-test < Pre-test
b. Post-test > Pre-test
c. Post-test = Pre-test

Based on Table 1 of the Wilcoxon signed-rank test results, it is shown that the data obtained reveal a difference between the pretest and posttest scores, indicating an increase in student Learning Activeness following the implementation of the Discovery Learning model supported by the Assemblr Edu platform. The results of the Wilcoxon test show that there were 20 students with positive ranks, with an average rank of 10.50 and a total rank of 210.00, while the number of negative ranks and ties was 0 students each. This indicates that all students experienced an increase in their learning activity scores after being taught using the Discovery Learning model supported by the Assemblr Edu platform. No students experienced a decrease in scores between the pretest and posttest. To clarify whether this increase is statistically significant, further analysis is required using the significance value (Asymp.Sig.) from the Wilcoxon test results, which can be seen in Table 5.

Table 5. Test Statistics

**Test Statistics[a]**

| | Post-test – Pre-test |
|---|---|
| Z | -3.921[b] |
| Asymptotic Significance (2-tailed) | .000 |

a. Wilcoxon Signed-Ranks Test
b. Based on negative ranks.

The results of the Wilcoxon test in Table 2 show a Z-value of -3.921 with an Asymp. Sig. (2-tailed) value of 0.000. The significance level used is 0.05 (0.000 < 0.05), so H0 is rejected and H1 is accepted. Thus, it can be concluded that there is a difference in learning activity scores between the pretest and posttest scores after the implementation of the Discovery Learning model aided by the Assemblr Edu media.

$H_1$: The Discovery Learning model supported by the Assemblr Edu media has an effect on the Learning Activeness of fifth-grade students at SDN Kahiyangan

$H_0$: There is no effect of the Discovery Learning model supported by Assemblr Edu media on the Learning Activeness of fifth-grade students at SDN Kahiyangan.

The research results indicate that there was an increase in students' Learning Activeness before and after the implementation of the Discovery Learning model supported by Assemblr Edu. This was demonstrated by the results of the statistical test using the Wilcoxon signed-rank test, which yielded an Asymp, Sig. (2-tailed) value of 0.000 with a significance level of 0.05 (0.000 < 0.05). The increase in student Learning Activeness was also demonstrated by the rank results, in which all students showed improvement based on positive ranks: 20 students with an average rank of 10.50 and a total rank of 210.00, while the number of negative ranks and ties was 0 students each. After conducting a hypothesis test, an N-Gain analysis was performed to determine the level of effectiveness in increasing student Learning Activeness. The analysis results showed that the N-Gain score obtained was 0.3429, which falls into the moderate category. These results indicate that the

implementation of the Discovery Learning model aided by the Assemblr Edu platform was able to increase student Learning Activeness at a fairly effective level. The moderate category indicates that there was an increase in Learning Activeness, although this increase did not yet fall into the high category. Student Learning Activeness increased due to the implementation of the Discovery Learning model supported by Assemblr Edu media; the implementation of this model can be seen in Table 6.

Table 6. Implementation of the Discovery Learning Model Supported by Assemblr Edu

| Instrument | Number of "Yes" Scores for Each Indicator | Minimum Score | Percentage (%) | Category |
|---|---|---|---|---|
| Observation Sheet for Learning Implementation | 18 | 21 | 85% | Very Good |

An increase in student engagement occurred because the Discovery Learning model supported by the Assemblr Edu platform was implemented effectively. This was demonstrated by the results of the observations. The implementation of the Discovery Learning model supported by the Assemblr Edu platform in the learning process achieved a success rate of 85%. This percentage falls into the "very good" category, indicating that most stages of the learning process were carried out in accordance with the lesson plan that had been developed. Assessment was conducted using an observation sheet containing aspects specified in the observation instrument. The implementation of the Discovery Learning model demonstrates that the syntax of this model can be effectively applied in the learning process. Through the Discovery Learning model supported by Assemblr Edu, students are given the opportunity to be directly involved in the learning process. By engaging in activities to seek information related to the material being studied, students are encouraged to discuss, collaborate to find necessary information, and draw conclusions. Consequently, student participation in the learning process increases. Learning that stimulates student engagement is further supported by the completion of Student Worksheets (LKPD) designed in alignment with the stages of the Discovery Learning model. The LKPD used in this study is shown in Figure 1.

The LKPD used in this study was designed in accordance with the syntax of the Discovery Learning model and integrated with the Assemblr Edu platform, thereby helping students observe learning objects interactively to support them in the process of discovering concepts. The activities designed in the LKPD guide students through the stages of stimulation, problem statement, data collection, data processing, verification, and generalization. The use of the worksheets designed according to the Discovery Learning model and integrated with the Assemblr Edu platform in each activity helps students understand the material through the visual representations on Assemblr Edu, thereby making the learning activities more

interactive. The worksheets also serve as a tool to facilitate students' active engagement in constructing knowledge.

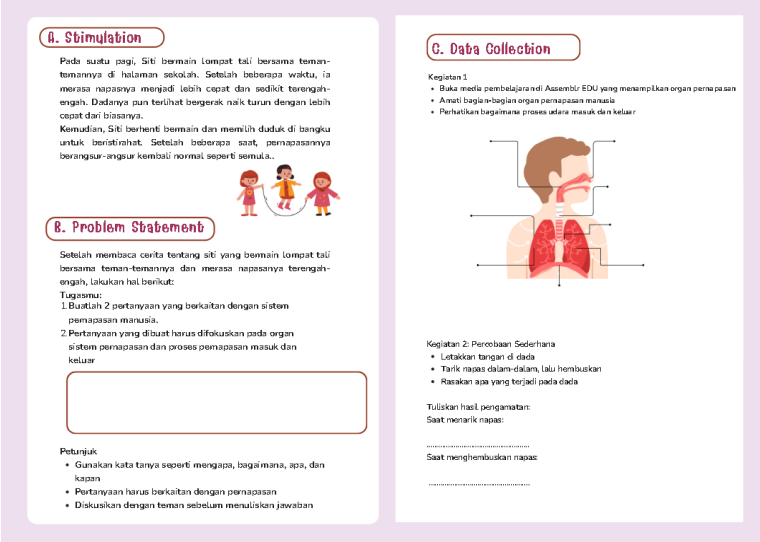


Figure 1. LKPD Display

The research results indicate that the implementation of the Discovery Learning model aided by the Assemblr Edu platform is effective in increasing the Learning Activeness of fifth-grade students in the subject of the human respiratory system. This was proven by the results of the Wilcoxon signed-rank test, which yielded a significance value (Asymp. Sig. 2-Tailed) of 0.000 with a significance level of 0.05 ($0.000 < 0.05$); thus, $H_0$ was rejected and $H_1$ was accepted. The Z-value obtained was -3.921, indicating a difference in students' Learning Activeness scores between before (pretest) and after (posttest) the implementation of instruction using the Discovery Learning model supported by the Assemblr Edu platform. Thus, the use of the Discovery Learning model supported by the Assemblr Edu platform is effective in enhancing students' Learning Activeness.

The increase in students' Learning Activeness occurred because the Discovery Learning model facilitates students in performing activities that help them construct their knowledge through discovery. The Discovery Learning model is a learning model that emphasizes students' active involvement during the learning process; the teacher does not present learning concepts comprehensively, but rather encourages students to explore a concept independently (Rahmadani et al., 2023) In line with (Bruner, 1961; Khasinah, 2021) , which states that the Discovery Learning model is a learning model that encourages students to actively participate in learning and to make their own discoveries and observations independently. The learning process using the Discovery Learning model requires students to participate more actively in the learning process; students are encouraged to actively discuss in learning groups so they can discover the material being studied. The Discovery Learning model also fosters a more active and participatory learning process, enabling students to solve problems they encounter in the material they are

studying. Through activities such as observation, discovery, inquiry, information gathering, and discussion, students will develop their understanding independently.

Instructional media also play a role in enhancing student engagement. Instructional media are tools that can help teachers create interactive learning experiences that increase student participation during instruction ( Gagne & Briggs, 1991; Prahesti & Fauziah, 2021) . The use of interactive digital media is a practical alternative solution for teachers to create an active learning process(Alifah et al., 2025) . Media that can visualize content and are interactive are capable of engaging students, increasing their curiosity, and fostering their interest in learning during the learning process. In line with the views of Aghisni et al. (2025) who argue that the use of interactive digital media is a key factor in increasing student engagement because it creates interactive learning experiences that are engaging. The use of Assemblr Edu as an innovative learning medium can provide teachers with ideas for creating effective learning strategies to support the achievement of optimal learning objectives (Azkiya et al., 2025) . Assemblr Edu is an augmented reality-based digital learning medium designed to make the learning process interactive, thereby increasing student engagement (Lestari et al., 2023) . The Assemblr Edu platform helps make learning more flexible and innovative through the available objects, thereby assisting teachers in visualizing abstract material.

The use of the Assemblr Edu platform contributes to increasing student engagement in learning. Assemblr Edu presents three-dimensional visualizations of objects, allowing students to observe the human respiratory system in a more concrete and interactive way. Through these visualizations, students are encouraged to explore the objects in the Assemblr Edu platform related to the organs of the human respiratory system, gather information, ask questions, and draw conclusions based on their observations. The characteristics of the Assemblr Edu platform align with constructivist theory, which forms the foundation of the Discovery Learning model a theory that emphasizes that learning is more meaningful when students construct their own knowledge through the independent process of discovering concepts (Bruner, 1961; Suriadi et al., 2025). Therefore, the use of the Assemblr Edu platform not only serves as a visual aid but also facilitates students' engagement in every stage of the Discovery Learning model, from observing objects, identifying problems, gathering and processing information, verifying results, to drawing conclusions. Through this engagement, students are given the opportunity to construct their own knowledge, thereby increasing their active participation in learning.

The use of the Assemblr Edu platform is aligned with the stages of the Discovery Learning model. After the teacher presents a stimulus in this case, images of human organs via Assemblr Edu students, working in groups, will access the Assemblr Edu platform using a QR code provided by the teacher. Students will then observe 3D visualizations of the human respiratory system including the nose, trachea, bronchi, bronchioles, lungs, and diaphragm with each image accompanied by a description of the definition and function of the respective respiratory organs. In addition, students will also observe the mechanism of human respiration on Assemblr Edu. Through these observations, students will identify the definitions and functions of

each respiratory organ, as well as the mechanism of human respiration, and then discuss and record this information in their worksheets. The results of these discussions will then be presented for verification. Next, students and teachers work together to draw conclusions based on the results of their observations using the Assemblr Edu platform. In this way, students grasp the concept of the human respiratory system through a process of observation, discussion, and drawing conclusions.

The use of the Assemblr Edu platform, which utilizes augmented reality technology, allows students to observe three-dimensional objects related to the lesson. This feature provides students with the opportunity to observe the shapes and structures of learning objects (Rhokhmatik et al., 2026). Additionally, the Assemblr Edu platform can enhance students' creativity, as demonstrated during the learning process, which encourages them to be actively engaged, open-minded, and independent in expressing their ideas (Al-Zahra & Handayani, 2025). Learning using Assemblr Edu also helps foster collaborative dynamics among students during the learning process (AbdiKusumo et al., 2026).

The results of this study align with research conducted by the (Rahmawati et al., 2024) which showed that the implementation of the Discovery Learning model can increase student learning activity. This was evident in the pre-cycle phase, where student learning activity fell into the moderate category in Cycle 1, the average score increased; and in Cycle II, it further improved and fell into the high category. During Cycle II, students participated more actively than in Cycle I through the implementation of the Discovery Learning model, students became more enthusiastic about the learning process. These research findings indicate that the Discovery Learning model can enhance students Learning Activeness and participation, and teachers can create more interactive learning experiences. Furthermore, the Discovery Learning model also enhances students learning motivation and academic achievement the inquiry-based nature of this model contributes to deeper student understanding (Mutmainnah et al., 2025). Discovery Learning helps improve academic achievement by fostering a learning environment that emphasizes inquiry and collaboration (Kusumawati et al., 2026).

The results of this study are also supported by observations of the implementation of the Discovery Learning model aided by the Assemblr Edu platform, which achieved an 85% success rate. This percentage falls into the "very good" category, indicating that learning using the Discovery Learning model aided by the Assemblr Edu platform was successfully implemented and aligned with the lesson plans that had been developed. Worksheets are an important tool for teachers in helping to make the classroom learning process more interactive (Susilawati et al., 2022) . The implementation of learning was also supported by worksheets designed in accordance with the syntax of the Discovery Learning model. The activities students completed on the worksheets were based on the stages of stimulation, problem statement, data collection, data processing, verification, and generalization. Each stage is designed to engage students in observation, discussion, information processing, and drawing conclusions, all integrated with the Assemblr Edu platform.

Based on the research findings, the application of the Discovery Learning model supported by the Assemblr Edu platform can serve as an alternative approach to science education in elementary schools, particularly for abstract topics such as the human respiratory system. The Discovery Learning model integrated with the Assemblr Edu platform fosters a more student-centered learning experience, thereby encouraging student participation in observing, asking questions, discussing, gathering information, and drawing conclusions about the material. Therefore, teachers can utilize this model and platform to create more interactive learning experiences and enhance student engagement in learning activities.

This study has several limitations that must be considered when interpreting the results. The study involved only one class with a relatively small sample size and no control group; thus, the findings cannot yet be broadly generalized to the population of elementary school students. Without a control group, the increase in student engagement cannot yet be compared to learning that uses other models or media. Nevertheless, the results of this study indicate that the application of the Discovery Learning model aided by the Assemblr Edu media has the potential to increase student engagement in the subject of the human respiratory system. Thus, future research is recommended to test the application of this model on different subjects and educational levels and to include a control group so that the research results can be generalized more broadly.

## 4. Conclusion

Based on the research questions and hypotheses proposed, the results of the hypothesis analysis, and the discussion of student Learning Activeness through the application of the Discovery Learning model supported by Assemblr Edu media for fifth-grade students at SDN Kahiyangan, the following research conclusions can be drawn:

Based on the research results, the implementation of learning using the Discovery Learning model supported by *Assemblr Edu* media was carried out effectively and had a positive impact on the Learning Activeness of fifth-grade students regarding the human respiratory system. The research findings indicate that the integration of the Discovery Learning model with Assemblr Edu media successfully helped students understand the concepts of the human respiratory system, encouraged their active participation, and created meaningful learning through direct experiences such as observing, searching for information, and drawing conclusions. Thus, the objectives of this study were achieved. The attainment of these learning objectives proves that the Discovery Learning model supported by Assemblr Edu can be effectively applied in teaching, particularly when covering the human respiratory system. In addition to having a positive impact on student engagement, this study also offers practical implications for teachers. Integrating the Discovery Learning model with Assemblr Edu can serve as an alternative solution for creating interactive and innovative learning experiences that help foster meaningful and engaging learning, particularly when teaching abstract concepts. However, this study has limitations due to its relatively small sample size, as it used only one class

as the research subject without a control group for comparison. Consequently, these findings do not generalize to the broader educational context. Further research is recommended to examine the Discovery Learning model supported by Assemblr Edu media on other learning topics and at different educational levels, thereby strengthening the generalizability and application of these research findings.

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