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Article Submission

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[jlds] Submission Acknowledgement

Bendaoud Nadif <kcrdjournals@gmail.com>
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19 May 2022 at 12:53

Meylan Saleh:

Thank you for submitting the manuscript, "The Effectiveness of Mordiscvein Learning Model to Enhance Student Learning Outcomes In Science Subject of IV Grade in Primary School In Limboto District, Gorontalo Regency" to Journal of Learning and Development Studies. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

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The Effectiveness of Mordiscvein Learning Model to Enhance Student Learning Outcomes In Science Subject of IV Grade in Primary School In Limboto District, Gorontalo Regency


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ABSTRACT

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This study aimed to explore the effectiveness of the developed Mordiscvein learning model. This research has been carried out in elementary schools in Limboto District Gorontalo District Gorontalo province. This research was conducted on fourth grade students of elementary school, including: SDN Elementary School 2 Limboto, SDN 11 Limboto, SDN 18 Limboto and SDN 15 Limboto with the theme material 6 my ideals within a period of 3 months in the even semester 2021/2022. Data was collected through tests, safety, and questionnaire. Effectiveness analysis data was determined through the results of the test scores of learning outcomes, student activity, and student response to the Mordiscvein learning model. The test Data were analyzed using paired T-test and N-Gain analysis. The results found that Mordiscvein learning model has a high level of effectiveness; it is shown that Mordiscvein learning model can improve student learning outcomes significantly from the analysis of the initial score and the final score.

1. Introduction

The PISA (Program for International Student Assessment) survey results revealed that Indonesia ranks 38th out of 41 countries surveyed with an average score of 393, significantly below Finland and Japan with mean score of 548. Furthermore, according to the PISA statistics from 2003, Indonesia is still experiencing unsatisfactory results with a score of 395 from 40 countries which has been essentially no change in Indonesia's ranking since 2000. While the year 2006 did not indicate significant progress from the PISA results, Indonesia remains in 50th place out of 57 nations surveyed, with an average score of 393 (Hayat and Yusuf, 2010). According to PISA survey results in 2015, Indonesia began to show an increase in points compared to previous years, but it remained in the top 10 of the low level which ranked 62 of 71 countries with a 403 points achievement, above Brazil but below Jordan (The Organisation for Economic Co-operation and Development, 2018). In 2018, Indonesia ranked 69th out of 74 countries participants, below Panama but above Morocco, with 371 for reading, 379 for mathematics, and 396 for science (The Organisation for Economic Co-operation and Development, 2018).

At this level of ability, Indonesia merely remembers facts, terms, and scientific laws and use them to draw simple scientific conclusions, in contrast to high-scoring countries are be able to demonstrate the ability to apply scientific knowledge, identify factors in scientific investigations, relate data to real-life situations, and draw conclusions based on scientific evidence, as well as communicate (Hayat & Yusuf, 2010). It is a concern to innovate in the field of education as it was done by the state of Finland when their results were low and what happened was game changing in the country and reach the top.

Based on the results of observations made in several schools in Gorontalo Regency and through Teacher Professional Education Program (PPG) activities conducted nationally through online learning, special learning in the content of science lessons in Grade 4 in elementary school is difficult to impart, even constrained by the lack of teacher mastery of the use of innovative learning models. Furthermore, it is not only limited in its application of learning models, but it also has an impact on student learning

outcomes in science subject that are still below Minimum Criteria of Mastery Learning (KKM) of 75. In addition, the data discovered that science subject is considered to be find difficult for both student and teacher. The struggle experienced by teachers is the adjustment of the learning model with the material to be taught.

To address the issues described earlier, the researcher must investigate a constructivism-based learning model aimed at improving the learning outcomes of primary school children. Furthermore, not only will this research increase learning results, but the learning model established will also foster students to think critically. The research will be limited to enhancing student learning outcomes through the development of learning models.

The learning Model that will be developed by researchers in improving student learning outcomes is the Morning Modiscvein (the Modification of Discovery and Inquiry Models) learning model, where this model can help solve problems in learning and teaching difficulties in educational institutions. In improving student learning outcomes by using this model, they will be easy to grasp knowledge critically. This model is considered very representative to unravel a number of unrest in student learning. The reason is that the principle used in this model is centered on students. Where this learning model is born from the modification between the learning model inquiry and discovery. The combination of models contained in this model, namely inquiry and discovery, is a guide to the production of Mordiscvein learning models. This Model is a new learning model but this model is a development of the learning model of inquiry and discovery. Mordiscvein learning model with student-centered learning characteristics is able to explore the potential of students in revealing a truth concept through inquiry and discovery.

The identification of problems in this study is limited to certain areas to limit research and data depth. This is an elementary school. The problem that occurs is as follows: (1) the use of a model that is still not appropriate and has not facilitated students to learn to independently find various facts and concepts in Learning Natural Sciences in elementary school; (2) Mordiscvein learning model as a model that emphasizes student-centered learning has not been involved by teachers in solving problems in Natural Science Learning in elementary school; (3) student learning outcomes are still low based on the results of PISA because of the problem of inadequate learning models and help students to make conclusions or analysis so that the results of Pisa so low. Based on the identification of the problems described above, the formulation of the problem in this study is how the effectiveness of the developed Mordiscvein learning model?

2. Methods

This research has been carried out in elementary schools in Limboto District Gorontalo District Gorontalo province. This research was conducted on fourth grade students of elementary school, including: SDN Elementary School 2 Limboto, SDN 11 Limboto, SDN 18 Limboto and SDN 15 Limboto with the theme material 6 my ideals within a period of 3 months in the even semester 2021/2022. The subject of validation trial consists of experts / experts, namely lecturers who have scientific fields in science and teachers as class teachers who have areas of expertise as a Bachelor of Basic Education. Development of learning tools in this study using ADDIE model, which consists of 5 stages of development, namely analysis, design, develop and implementation and evaluation. The effectiveness of the learning model is described based on data on the achievement of student learning outcomes, namely the mastery of concepts in the Material Theme 6 "*Cita-citaku*". Data was collected through tests, safety, and questionnaire. Effectiveness analysis data was determined through the results of the test scores of learning outcomes, student activity, and student response to the Mordiscvein learning model. The test Data were analyzed using paired T-test and N-Gain analysis.

3. Results and Discussion

3.1. Learning Model Structure of Mordiscvein

The first stage of the Mordiscvein model is the *opening surprise* where students will take a roll of paper that has been provided by the teacher. In the roll of paper is really written one word that will be solved by the students themselves about the word. One word written on the roll of paper is part of the material that will be discussed together on that day. For example, types of animals and plants that undergo changes in shape. After that, students will discuss in groups about the words in the paper roll. Each member of the group must provide input on or suggestions about the word that is written on the roll of paper.

The second stage of *ice Breaking*. In determining the formulation of problems and hypotheses is done through *ice breaking* activities by providing songs that are tailored to the material to be delivered (sing together). In singing the song, the bias is also not adjusted to the material, the song is free in accordance with the wishes of the students. Thus, the students in learning do not feel any pressure from the teacher. *Ice breaking* activities is led by teachers. The game started when song stops and the teacher's hand leads to the intended group, then the group is obliged to read the results of their discussion in the form of identification of the problems they have compiled and so on until all the groups convey the results of their group work. In accordance with the opinion (Hartati et al., 2020) the skill of working together is practiced through activities in group learning activities.

The third stage is to formulate experimental steps by means of relay, followed by experiments. In this third stage, the students formulate the steps of the experiment based on the problems that have been shared by the teacher. In this phase students are trained to be able to draw up their own steps of activities that they will do in the group using their own language. At the time of preparation of these experimental steps, the teacher will act as a facilitator in observing each student's performance.

In this phase students are trained to think how to structure the steps of experimental activities, accustoming students to discover for themselves, not necessarily everything from the teacher. In accordance with the theory of learning constructivism if the conclusion is drawn that knowledge comes from the student's own thinking, while the teacher is only a facilitator for students. As stated by (Damopolii et al., 2020) that in the constructivism approach, the strategy for acquiring something is crucial than the amount of knowledge acquired by the student.

Learning should encourage students to think critically about problems in learning. Teachers must be able to observe and measure students' critical thinking skill. Learning process should be able to improve the critical thinking skills of learners. Thinking skills are one of the important skills that need to be improved in the 21st century.

The fourth phase is the publication of data, each group will publish the results that they have been able to go through the work of the group in accordance with the problems written in the initial phase of the opening surprise. For example, the group obtained the word Grasshopper, meaning that all members of the group will cooperate with each other to discuss the Grasshopper as students know. In this phase, students are also trained to develop their potential in thinking to be able to appear in front of the class in publishing the work of their group. In accordance with the 21st century learning, where students are required to have learning skills and innovation, which is related to the ability to think critically. As stated by Hartati et al., 2020 that in this 21st Century Learning students are required to have the ability to freedom of thought in a learning process. In this publication activity, students submit it in accordance with LKPD orders that have been distributed by teachers.

The fifth stage is to determine the facts through 'Rise Hand' method, the students guess the sentence that will be delivered by the teacher. In the delivery of the sentence contains material that has been taught by the teacher then students are asked to determine whether the sentence is fact or not. If the sentence is a fact, then the student raises his right hand, if the sentence is not a fact then the student raises his left hand. Then in answering the fact or not must be accompanied by the reason. Thus, students did not just guess whether the sentence belongs to the category of facts or not. The purpose of this phase is that students are expected to be able to relate the facts and the reasons by using their own sentences before being assisted by the teacher. In this phase will show students' enthusiastic about struggling to answer the teacher's questions in determining the facts or not.

The last stage is the sixth to string keywords into conclusions. In the learning model, to conclude activities is teacher's duty. In contrast, Mordiscvein learning model, the students themselves will conduct conclusion activities, but the withdrawal of the conclusion is only in the form of one keyword. For instance, the keyword corresponds to the one on the grasshopper paper roll. Hence, each group will conclude according to the word on the roll of paper. After the student concludes the teacher will add the answers to the results of the conclusions of all groups.

3.2. Discussion of the Effectiveness of Mordiscvein Learning Model

The results of the trial in the school SDN 2 Primary School in Limboto showed that the pretest (initial test) of 57.32% and the post test (final test) of 74.64%. Overall in limited trials the improvement of student learning outcomes varies between limited trials. The average value of N-Gain is included in the high category with a value of 0.75 if it is certified to 75% with the N-Gain category the percentage is effective.

The significance of improving student learning outcomes on theme 6 on the content of science lesson Class IV SD between the initial test score and the final Test score after the implementation of learning using Mordiscvein learning model was done using statistical test SPSS 26.0. The significance of improving student learning outcomes between the results of the initial test score and the final Test score is processed using the SPSS 26.0 application and meets the requirements of normally distributed data. The increase in student learning outcomes between the initial test results and the final test results at the level of significance set out in this study was 0.05.

The extensive trials for this learning outcome test were conducted in three schools in Limboto district, namely SDN 11 Limboto school, SDN 18 Limboto and SDN 15 Limboto. Learning outcomes data obtained from students' ability to answer questions from the material that has been learned in about the theme 6 Class IV metamorphosis, which is shown by the score obtained by students through the test learning outcomes obtained through data processing using the application SPSS 26.0.

The data of pretest and posttest processing results in extensive trials at SDN 11 Limboto schools can be seen in the pretest and posttest tables obtained from the results of data analysis using SPSS 26.0 applications. Where with SPSS 26.0 application will be read normalcy data also static hypothesis. Based on processed data SPSS 26.0 shows that, plots follow the fit line. If the plots follow the fit line, then the data is said to be normally distributed.

Further, the normality test results revealed that pretest (initial test) and posttest (final Test) learning results for limited trial class obtained significance of 0.05. Thus, it can be concluded that the score of the initial test and the final test of the trial class is normally distributed. Based on the data analysis, the data is normally distributed and has qualified for paired tests.

Moreover, there was an increase in student learning outcomes, namely the results of pretest (initial test) of 50.86% and the posttest (final test) of 76.38%. Overall in limited trials students' learning outcomes vary between limited trials. The average value of N-Gain is included in the high category with a value of 0.72 or in the N-Gain Percentage is in the effective category.

The significance of improving student learning outcomes on theme 6 on the content of science lesson Class IV SD between the initial test score and the final Test score after the implementation of learning using Mordiscvein learning model is done using statistical tests with the help of SPSS 26.0 application. The significance of improving student learning outcomes between the results of the initial test score and the final Test score qualifies where the data is normally distributed. The increase in student learning outcomes between the initial test results and the final test results at the level of significance set out in this study was 0.05.

This test was conducted at SDN 18 Limboto. Learning outcomes data obtained from the ability of students to answer questions from the material that has been learned in the theme of 6 Class IV metamorphosis, which is shown by the score obtained by students through the test learning outcomes.

Based on the processed data of SPSS 26.0 on the results of pretest and posttest, in table 4.23, it is seen that the pre-test data obtained value is 54.41 while for the post-test value obtained value is 74.12. As for the value of N-gain score is also obtained through processing using the application SPSS 26.0 which is 0.70 with a high category.

Based on data processing using SPSS 26.0 application shows an increase in Test learning outcomes for SDN 18 Limboto school, where the pretest (initial test) of 54.41 and the posttest (final test) of 74.12. Overall, in extensive trials for school SDN 18 Limboto varied. The average value of N-Gain score is included in the high category with a value of 0.70.

For the level of significance of the test of learning outcomes between pretest and posttest after the implementation of teaching and learning activities, especially in the content of science lessons Class IV Elementary School by using Mordiscvein learning model Mordiscvein, statistical tests are carried out using SPSS 26.0 application. The significance of the improvement of learning outcomes between pretest results and post-test results qualified normal distributed data. Data can be said to be normally distributed if the plots follow the fit line. If the plots follow *the fit line*. Based on the processed data about the results of the pretest and posttest, pretest data obtained value of 46.07 while for the value of post est obtained value of 80.00. As for the value of N-gain obtained a score of 0.68 with a medium category.

Figure diagram 4.6 shows an increase in Test learning outcomes for school SDN 15 Limboto, where the results of pretest (initial test) of 46.07 and the posttest (final test) of 80.00. Overall, in the extensive trials for SDN 15 Limboto varied. The average value of N-Gain score is included in the high category with a value of 0.66 medium.

For the level of significance of the test of learning outcomes between pre-test and post-test after the implementation of teaching and learning activities, especially in the content of science lessons Class IV Elementary School by using Mordiscvein learning model. Mordiscvein, statistical tests are carried out using SPSS 26.0 applications. The significance of the improvement of learning outcomes between pre-test results and post test results meet the requirements of normally distributed data. The data is normally distributed if the plots follow the fit line.

4. Conclusion

Mordiscvein learning model has a high level of effectiveness; it is shown that Mordiscvein learning model can improve student learning outcomes significantly from the analysis of the initial score and the final score. Some limitations of research at the time of application of Mordiscvein learning model are including: (1) Mordiscvein learning Model was only tested in Class IV theme 6

my ideals, especially in the content of science lessons metamorphosis material. (2) Mordiscvein learning model is only tested in classes with less than 30 students so that this model is not necessarily practical and effective in students with more than 30 people.

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Conflicts of Interest: The authors declare no conflict of interest.

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Hasil Peer Review

28 Mei 2022

[jlds] Decision on Manuscript

AI-Kindi Center for Research and Development (KCRD) <kcrdjournals@gmail.com>

28 May 2022 at 16:18

To: Meylan Saleh <meylansaleh.ung@gmail.com>, "Sarson W. Dj. Pomalato" <sarsonpomalato789@gmail.com>, "Novri Y. Kandowangko" <novrikandowangko.ung@gmail.com>, Opir Rumape <opirrumape.ung@gmail.com>, Ishak Isa <ishakisa.ung@gmail.com>, Ramli Utina <ramliutina.ung@gmail.com>, "Frida M. Yusuf" <fridamaryatiusuf.ung@gmail.com>

Dear Meylan Saleh, Sarson W. Dj. Pomalato, Novri Y. Kandowangko, Opir Rumape, Ishak Isa, Ramli Utina, Frida M. Yusuf,

Many thanks for your submission to our journal. We have reached a decision regarding your submission to Journal of Learning and Development Studies, "The Effectiveness of Mordiscvein Learning Model to Enhance Student Learning Outcomes In Science Subject of IV Grade in Primary School In Limboto District, Gorontalo Regency". After your paper has been subject to a Fast Track Review Process, it has been accepted to be published in our journal subject to minor revisions. Please find the results attached. After you make the revisions, send us the revised paper as soon as possible.

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ABSTRACT

This study aimed to explore the effectiveness of the developed Mordiscvein learning model. This research has been carried out in elementary schools in Limboto District Gorontalo province. This research was conducted on fourth grade students of elementary school, including: SDN Elementary School 2 Limboto, SDN 11 Limboto, SDN 18 Limboto and SDN 15 Limboto with the theme material 6 my ideals within a period of 3 months in the even semester 2021/2022. Data was collected through tests, safety, and questionnaire. Effectiveness analysis data was determined through the results of the test scores of learning outcomes, student activity, and student response to the Mordiscvein learning model. The test Data were analyzed using paired T-test and N-Gain analysis. The results found that Mordiscvein learning model has a high level of effectiveness; it is shown that Mordiscvein learning model can improve student learning outcomes significantly from the analysis of the initial score and the final score.

1. Introduction

The PISA (Program for International Student Assessment) survey results revealed that Indonesia ranks 38th out of 41 countries surveyed with an average score of 393, significantly below Finland and Japan with mean score of 548. Furthermore, according to the PISA statistics from 2003, Indonesia is still experiencing unsatisfactory results with a score of 395 from 40 countries which has been essentially no change in Indonesia's ranking since 2000. While the year 2006 did not indicate significant progress from the PISA results, Indonesia remains in 50th place out of 57 nations surveyed, with an average score of 393 (Hayat and Yusuf, 2010). According to PISA survey results in 2015, Indonesia began to show an increase in points compared to previous years, but it remained in the top 10 of the low level which ranked 62 of 71 countries with a 403 points achievement, above Brazil but below Jordan (The Organisation for Economic Co-operation and Development, 2018). In 2018, Indonesia ranked 69th out of 74 countries participants, below Panama but above Morocco, with 371 for reading, 379 for mathematics, and 396 for science (The Organisation for Economic Co-operation and Development, 2018).

At this level of ability, Indonesia merely remembers facts, terms, and scientific laws and use them to draw simple scientific conclusions, in contrast to high-scoring countries are be able to demonstrate the ability to apply scientific knowledge, identify factors in scientific investigations, relate data to real-life situations, and draw conclusions based on scientific evidence, as well as communicate (Hayat & Yusuf, 2010). It is a concern to innovate in the field of education as it was done by the state of Finland when their results were low and what happened was game changing in the country and reach the top.

Based on the results of observations made in several schools in Gorontalo Regency and through Teacher Professional Education Program (PPG) activities conducted nationally through online learning, special learning in the content of science lessons in Grade 4 in elementary school is difficult to impart, even constrained by the lack of teacher mastery of the use of innovative learning models. Furthermore, it is not only limited in its application of learning models, but it also has an impact on student learning outcomes in science subject that are still below Minimum Criteria of Mastery Learning (KKM) of 75. In addition, the data discovered that science subject is considered to be find difficult for both student and teacher. The struggle experienced by teachers is the adjustment of the learning model with the material to be taught.

To address the issues described earlier, the researcher must investigate a constructivism-based learning model aimed at improving the learning outcomes of primary school children. Furthermore, not only will this research increase learning results, but the learning model established will also foster students to think critically. The research will be limited to enhancing student learning outcomes through the development of learning models.

The learning Model that will be developed by researchers in improving student learning outcomes is the Morning Modiscvein (the Modification of Discovery and Inquiry Models) learning model, where this model can help solve problems in learning and teaching difficulties in educational institutions. In improving student learning outcomes by using this model, they will be easy to grasp knowledge critically. This model is considered very representative to unravel a number of unrest in student learning. The reason is that the principle used in this model is centered on students. Where this learning model is born from the modification between the learning model inquiry and discovery. The combination of models contained in this model, namely inquiry and discovery, is a guide to the production of Mordiscvein learning models. This Model is a new learning model but this model is a development of the learning model of inquiry and discovery. Mordiscvein learning model with student-centered learning characteristics is able to explore the potential of students in revealing a truth concept through inquiry and discovery.

The identification of problems in this study is limited to certain areas to limit research and data depth. This is an elementary school. The problem that occurs is as follows: (1) the use of a model that is still not appropriate and has not facilitated students to learn to independently find various facts and concepts in Learning Natural Sciences in elementary school; (2) Mordiscvein learning model as a model that emphasizes student-centered learning has not been involved by teachers in solving problems in Natural Science Learning in elementary school; (3) student learning outcomes are still low based on the results of PISA because of the problem of inadequate learning models and help students to make conclusions or analysis so that the results of Pisa so low. Based on the identification of the problems described above, the formulation of the problem in this study is how the effectiveness of the developed Mordiscvein learning model?

2. Methods

This research has been carried out in elementary schools in Limboto District Gorontalo District Gorontalo province. This research was conducted on fourth grade students of elementary school, including: SDN Elementary School 2 Limboto, SDN 11 Limboto, SDN 18 Limboto and SDN 15 Limboto with the theme material 6 my ideals within a period of 3 months in the even semester 2021/2022. The subject of validation trial consists of experts / experts, namely lecturers who have scientific fields in science and teachers as class teachers who have areas of expertise as a Bachelor of Basic Education. Development of learning tools in this study using ADDIE model, which consists of 5 stages of development, namely analysis, design, develop and implementation and evaluation. The effectiveness of the learning model is described based on data on the achievement of student learning outcomes, namely the mastery of concepts in the Material Theme 6 "*Cita-citaku*". Data was collected through tests, safety, and questionnaire. Effectiveness analysis data was determined through the results of the test scores of learning outcomes, student activity, and student response to the Mordiscvein learning model. The test Data were analyzed using paired T-test and N-Gain analysis.

3. Results and Discussion

3.1. Learning Model Structure of Mordiscvein

The first stage of the Mordiscvein model is the *opening surprise* where students will take a roll of paper that has been provided by the teacher. In the roll of paper is really written one word that will be solved by the students themselves about the word. One word written on the roll of paper is part of the material that will be discussed together on that day. For example, types of animals and plants that undergo changes in shape. After that, students will discuss in groups about the words in the paper roll. Each member of the group must provide input on or suggestions about the word that is written on the roll of paper.

The second stage of *ice Breaking*. In determining the formulation of problems and hypotheses is done through *ice breaking* activities by providing songs that are tailored to the material to be delivered (sing together). In singing the song, the bias is also not adjusted to the material, the song is free in accordance with the wishes of the students. Thus, the students in learning do not feel any pressure from the teacher. *Ice breaking* activities is led by teachers. The game started when song stops and the teacher's hand leads to the intended group, then the group is obliged to read the results of their discussion in the form of identification of the problems they have compiled and so on until all the groups convey the results of their group work. In accordance with the opinion (Hartati et al., 2020) the skill of working together is practiced through activities in group learning activities.

The third stage is to formulate experimental steps by means of relay, followed by experiments. In this third stage, the students formulate the steps of the experiment based on the problems that have been shared by the teacher. In this phase students are trained to be able to draw up their own steps of activities that they will do in the group using their own language. At the time of preparation of these experimental steps, the teacher will act as a facilitator in observing each student's performance.

In this phase students are trained to think how to structure the steps of experimental activities, accustoming students to discover for themselves, not necessarily everything from the teacher. In accordance with the theory of learning constructivism if the conclusion is drawn that knowledge comes from the student's own thinking, while the teacher is only a facilitator for students. As stated by (Damopolii et al., 2020) that in the constructivism approach, the strategy for acquiring something is crucial than the amount of knowledge acquired by the student.

Learning should encourage students to think critically about problems in learning. Teachers must be able to observe and measure students' critical thinking skill. Learning process should be able to improve the critical thinking skills of learners. Thinking skills are one of the important skills that need to be improved in the 21st century.

The fourth phase is the publication of data, each group will publish the results that they have been able to go through the work of the group in accordance with the problems written in the initial phase of the opening surprise. For example, the group obtained the word Grasshopper, meaning that all members of the group will cooperate with each other to discuss the Grasshopper as students know. In this phase, students are also trained to develop their potential in thinking to be able to appear in front of the class in publishing the work of their group. In accordance with the 21st century learning, where students are required to have learning skills and innovation, which is related to the ability to think critically. As stated by Hartati et al., 2020 that in this 21st Century Learning students are required to have the ability to freedom of thought in a learning process. In this publication activity, students submit it in accordance with LKPD orders that have been distributed by teachers.

The fifth stage is to determine the facts through 'Rise Hand' method, the students guess the sentence that will be delivered by the teacher. In the delivery of the sentence contains material that has been taught by the teacher then students are asked to determine whether the sentence is fact or not. If the sentence is a fact, then the student raises his right hand, if the sentence is not a fact then the student raises his left hand. Then in answering the fact or not must be accompanied by the reason. Thus, students did not just guess whether the sentence belongs to the category of facts or not. The purpose of this phase is that students are expected to be able to relate the facts and the reasons by using their own sentences before being assisted by the teacher. In this phase will show students' enthusiastic about struggling to answer the teacher's questions in determining the facts or not.

The last stage is the sixth to string keywords into conclusions. In the learning model, to conclude activities is teacher's duty. In contrast, Mordiscvein learning model, the students themselves will conduct conclusion activities, but the withdrawal of the conclusion is only in the form of one keyword. For instance, the keyword corresponds to the one on the grasshopper paper roll. Hence, each group will conclude according to the word on the roll of paper. After the student concludes the teacher will add the answers to the results of the conclusions of all groups.

3.2. Discussion of the Effectiveness of Mordiscvein Learning Model

The results of the trial in the school SDN 2 Primary School in Limboto showed that the pretest (initial test) of 57.32% and the post test (final test) of 74.64%. Overall in limited trials the improvement of student learning outcomes varies between limited trials. The average value of N-Gain is included in the high category with a value of 0.75 if it is certified to 75% with the N-Gain category the percentage is effective.

The significance of improving student learning outcomes on theme 6 on the content of science lesson Class IV SD between the initial test score and the final Test score after the implementation of learning using Mordiscvein learning model was done using statistical test SPSS 26.0. The significance of improving student learning outcomes between the results of the initial test score and the final Test score is processed using the SPSS 26.0 application and meets the requirements of normally distributed data. The increase in student learning outcomes between the initial test results and the final test results at the level of significance set out in this study was 0.05.

The extensive trials for this learning outcome test were conducted in three schools in Limboto district, namely SDN 11 Limboto school, SDN 18 Limboto and SDN 15 Limboto. Learning outcomes data obtained from students' ability to answer questions from the material that has been learned in about the theme 6 Class IV metamorphosis, which is shown by the score obtained by students through the test learning outcomes obtained through data processing using the application SPSS 26.0.

The data of pretest and posttest processing results in extensive trials at SDN 11 Limboto schools can be seen in the pretest and posttest tables obtained from the results of data analysis using SPSS 26.0 applications. Where with SPSS 26.0 application will be read normalcy data also static hypothesis. Based on processed data SPSS 26.0 shows that, plots follow the fit line. If the plots follow the fit line, then the data is said to be normally distributed.

Further, the normality test results revealed that pretest (initial test) and posttest (final Test) learning results for limited trial class obtained significance of 0.05. Thus, it can be concluded that the score of the initial test and the final test of the trial class is normally distributed. Based on the data analysis, the data is normally distributed and has qualified for paired tests.

Moreover, there was an increase in student learning outcomes, namely the results of pretest (initial test) of 50.86% and the posttest (final test) of 76.38%. Overall in limited trials students' learning outcomes vary between limited trials. The average value of N-Gain is included in the high category with a value of 0.72 or in the N-Gain Percentage is in the effective category.

The significance of improving student learning outcomes on theme 6 on the content of science lesson Class IV SD between the initial test score and the final Test score after the implementation of learning using Mordiscvein learning model is done using statistical tests with the help of SPSS 26.0 application. The significance of improving student learning outcomes between the results of the initial test score and the final Test score qualifies where the data is normally distributed. The increase in student learning outcomes between the initial test results and the final test results at the level of significance set out in this study was 0.05.

This test was conducted at SDN 18 Limboto. Learning outcomes data obtained from the ability of students to answer questions from the material that has been learned in the theme of 6 Class IV metamorphosis, which is shown by the score obtained by students through the test learning outcomes.

Based on the processed data of SPSS 26.0 on the results of pretest and posttest, in table 4.23, it is seen that the pre-test data obtained value is 54.41 while for the post-test value obtained value is 74.12. As for the value of N-gain score is also obtained through processing using the application SPSS 26.0 which is 0.70 with a high category.

Based on data processing using SPSS 26.0 application shows an increase in Test learning outcomes for SDN 18 Limboto school, where the pretest (initial test) of 54.41 and the posttest (final test) of 74.12. Overall, in extensive trials for school SDN 18 Limboto varied. The average value of N-Gain score is included in the high category with a value of 0.70.

For the level of significance of the test of learning outcomes between pretest and posttest after the implementation of teaching and learning activities, especially in the content of science lessons Class IV Elementary School by using Mordiscvein learning model Mordiscvein, statistical tests are carried out using SPSS 26.0 application. The significance of the improvement of learning outcomes between pretest results and post-test results qualified normal distributed data. Data can be said to be normally distributed if the plots follow the fit line. If the plots follow *the fit line*. Based on the processed data about the results of the pretest and posttest, pretest data obtained value of 46.07 while for the value of post est obtained value of 80.00. As for the value of N-gain obtained a score of 0.68 with a medium category.

Figure diagram 4.6 shows an increase in Test learning outcomes for school SDN 15 Limboto, where the results of pretest (initial test) of 46.07 and the posttest (final test) of 80.00. Overall, in the extensive trials for SDN 15 Limboto varied. The average value of N-Gain score is included in the high category with a value of 0.66 medium.

For the level of significance of the test of learning outcomes between pre-test and post-test after the implementation of teaching and learning activities, especially in the content of science lessons Class IV Elementary School by using Mordiscvein learning model. Mordiscvein, statistical tests are carried out using SPSS 26.0 applications. The significance of the improvement of learning outcomes between pre-test results and post test results meet the requirements of normally distributed data. The data is normally distributed if the plots follow the fit line.

4. Conclusion

Mordiscvein learning model has a high level of effectiveness; it is shown that Mordiscvein learning model can improve student learning outcomes significantly from the analysis of the initial score and the final score. Some limitations of research at the time of application of Mordiscvein learning model are including: (1) Mordiscvein learning Model was only tested in Class IV theme 6 my ideals, especially in the content of science lessons metamorphosis material. (2) Mordiscvein learning model is only tested in classes with less than 30 students so that this model is not necessarily practical and effective in students with more than 30 people.

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Conflicts of Interest: The authors declare no conflict of interest.

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The Effectiveness of Mordiscvein Learning Model to Enhance Student Learning Outcomes In Science Subject of IV Grade in Primary School In Limboto District, Gorontalo Regency

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outcomes in science subjects that are still below the Minimum Criteria of Mastery Learning (KKM) of 75. In addition, the data discovered that science subject is considered to be difficult for both students and teachers. The struggle experienced by teachers is the adjustment of the learning model with the material to be taught.

To address the issues described earlier, the researcher must investigate a constructivism-based learning model aimed at improving the learning outcomes of primary school children. Furthermore, not only will this research increase learning results, but the learning model established will also foster students to think critically. The research will be limited to enhancing student learning outcomes through the development of learning models.

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3. Results and Discussion

3.1. Learning Model Structure of Mordiscvein

The first stage of the Mordiscvein model is the *opening surprise* where students will take a roll of paper that has been provided by the teacher. In the roll of paper is really written one word that will be solved by the students themselves about the word. One word written on the roll of paper is part of the material that will be discussed together on that day. For example, types of animals and plants that undergo changes in shape. After that, students will discuss in groups about the words in the paper roll. Each member of the group must provide input or suggestions about the word that is written on the roll of paper.

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3.2. Discussion of the Effectiveness of Mordiscvein Learning Model

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The significance of improving student learning outcomes on theme 6 on the content of science lesson Class IV SD between the initial test score and the final Test score after the implementation of learning using Mordiscvein learning model was done using statistical test SPSS 26.0. The significance of improving student learning outcomes between the results of the initial test score and the final Test score is processed using the SPSS 26.0 application and meets the requirements of normally distributed data.

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Moreover, there was an increase in student learning outcomes, namely the results of pretest (initial test) of 50.86% and the posttest (final test) of 76.38%. Overall in limited trials students' learning outcomes vary between limited trials. The average value of N-Gain is included in the high category with a value of 0.72 or in the N-Gain Percentage is in the effective category.

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For the level of significance of the test of learning outcomes between pretest and posttest after the implementation of teaching and learning activities, especially in the content of science lessons Class IV Elementary School, by using Mordiscvein learning model Mordiscvein, statistical tests are carried out using SPSS 26.0 application. The significance of the improvement of learning outcomes between pretest results and post-test results qualified normal distributed data. Data can be said to be normally distributed if the plots follow the fit line. If the plots follow *the fit line*. Based on the processed data about the results of the pretest and posttest, pretest data obtained value of 46.07 while ~~for~~ the value of post est obtained value of 80.00. As for the value of N-gain obtained a score of 0.68 with a medium category.

Figure diagram 4.6 shows an increase in Test learning outcomes for school SDN 15 Limboto, where the results of pretest (initial test) of 46.07 and the posttest (final test) of 80.00. Overall, in the extensive trials for SDN 15 Limboto varied. The average value of N-Gain score is included in the high category with a value of 0.66 medium.

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4. Conclusion

Comment [A1]: Make sure that you managed to cover these points in order:

- Re-state the objective(s) of the study
- Re-state the key findings you made throughout the body of the paper
- Tell the reader what contribution your study has made to the existing literature/ OR highlight the overall significance of your study
- Highlight any limitations of your study
- Give suggestions for future research.

The study aimed to explore the effectiveness of the developed Mordiscvein learning model. This research has been carried out in elementary schools in Limboto District Gorontalo District Gorontalo Province. The study found that Mordiscvein learning model has a high level of effectiveness; it is shown that Mordiscvein learning model can improve student learning outcomes significantly from the analysis of the initial score and the final score. Some limitations of research at the time of application of Mordiscvein learning model are including: (1) Mordiscvein learning Model was only tested in Class IV theme 6 my ideals, especially in the content of science lessons metamorphosis material. (2) Mordiscvein learning model is only tested in classes with less than 30 students so that this model is not necessarily practical and effective in students with more than 30 people. According to the previous limitations, future study should be conducted in testing other learning model.

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RESEARCH ARTICLE

The Effectiveness of Mordiscvein Learning Model to Enhance Student Learning Outcomes in Science Subject of IV Grade in Primary School in Limboto District, Gorontalo Regency

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ABSTRACT

This study aimed to explore the effectiveness of the developed Mordiscvein learning model. This research has been carried out in elementary schools in Limboto District Gorontalo District Gorontalo province. This research was conducted on fourth-grade students of elementary school, including SDN Elementary School 2 Limboto, SDN 11 Limboto, SDN 18 Limboto, and SDN 15 Limboto, with the theme material 6 my ideals within a period of 3 months in the even semester 2021/2022. Data was collected through tests, safety, and questionnaire. Effectiveness analysis data was determined through the results of the test scores of learning outcomes, student activity, and student response *to the Mordiscvein learning model*. The test data were analyzed using paired T-test and N-Gain analysis. The results found that the Mordiscvein learning model has a high level of effectiveness; it is shown that *the Mordiscvein learning model* can improve student learning outcomes significantly from the analysis of the initial score and the final score.

KEYWORDS

Mordiscvein learning model, primary school, students learning outcomes, science subject

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1. Introduction

The PISA (Program for International Student Assessment) survey results revealed that Indonesia ranks 38th out of 41 countries surveyed with an average score of 393, significantly below Finland and Japan with a mean score of 548. Furthermore, according to the PISA statistics from 2003, Indonesia is still experiencing unsatisfactory results with a score of 395 from 40 countries which has been essentially no change in Indonesia's ranking since 2000. While the year 2006 did not indicate significant progress from the PISA results, Indonesia remains in 50th place out of 57 nations surveyed, with an average score of 393 (Hayat & Yusuf, 2010). According to PISA survey results in 2015, Indonesia began to show an increase in points compared to previous years, but it remained in the top 10 of the low level, which ranked 62 of 71 countries with a 403 points achievement, above Brazil but below Jordan (The Organisation for Economic Co-operation and Development, 2018). In 2018, Indonesia ranked 69th out of 74 countries participants, below Panama but above Morocco, with 371 for reading, 379 for mathematics, and 396 for science (The Organisation for Economic Co-operation and Development, 2018).

At this level of ability, Indonesia merely remembers facts, terms, and scientific laws and uses them to draw simple scientific conclusions, in contrast to high-scoring countries that are able to demonstrate the ability to apply scientific knowledge, identify factors in scientific investigations, relate data to real-life situations, and draw conclusions based on scientific evidence, as well as communicate (Hayat & Yusuf, 2010). It is a concern to innovate in the field of education as it was done by the state of Finland when their results were low, and what happened was game-changing in the country and reached the top.

Based on the results of observations made in several schools in Gorontalo Regency and through Teacher Professional Education Program (PPG) activities conducted nationally through online learning, special learning in the content of science lessons in Grade 4 in elementary school is difficult to impart; even constrained by the lack of teacher mastery of the use of innovative learning models. Furthermore, it is not only limited in its application of learning models, but it also has an impact on student learning outcomes in science subjects that are still below the Minimum Criteria of Mastery Learning (KKM) of 75. In addition, the data discovered that science subject is considered to find difficult for both students and teachers. The struggle experienced by teachers is the adjustment of the learning model with the material to be taught.

To address the issues described earlier, the researcher must investigate a constructivism-based learning model aimed at improving the learning outcomes of primary school children. Furthermore, not only will this research increase learning results, but the learning model established will also foster students to think critically. The research will be limited to enhancing student learning outcomes through the development of learning models.

The learning model that will be developed by researchers to improve student learning outcomes is the Morning Modiscvein (the Modification of Discovery and Inquiry Models) learning model, where this model can help solve problems in learning and teaching difficulties in educational institutions. Improving student learning outcomes by using this model will make it easy to grasp knowledge critically. This model is considered very representative of unraveling a number of unrest in student learning. The reason is that the principle used in this model is centered on students, Where this learning model is born from the modification between the learning model inquiry and discovery. The combination of models in this model, namely inquiry and discovery, guides the production of Mordiscvein learning models. This Model is a new learning model, but this model is a development of the learning model of inquiry and discovery. Mordiscvein's learning model with student-centered learning characteristics is able to explore the potential of students in revealing a truth concept through inquiry and discovery.

The identification of problems in this study is limited to certain areas to limit research and data depth. This is an elementary school. The problem that occurs is as follows: (1) the use of a model that is still not appropriate and has not facilitated students to learn to independently find various facts and concepts in Learning Natural Sciences in elementary school; (2) Mordiscvein learning model as a model that emphasizes student-centered learning has not been involved by teachers in solving problems in Natural Science Learning in elementary school; (3) student learning outcomes are still low based on the results of PISA because of the problem of inadequate learning models and help students to make conclusions or analysis so that the results of Pisa so low. Based on the identification of the problems described above, the formulation of the problem in this study is how the effectiveness of the developed Mordiscvein learning model?

2. Methods

This research has been carried out in elementary schools in Limboto District Gorontalo District Gorontalo province. This research was conducted on fourth-grade students of elementary school, including SDN Elementary School 2 Limboto, SDN 11 Limboto, SDN 18 Limboto, and SDN 15 Limboto, with the theme material 6 my ideals within a period of 3 months in the even semester 2021/2022. The subject of the validation trial consists of experts/experts, namely lecturers who have scientific fields in science and teachers as class teachers who have areas of expertise as a Bachelor of Basic Education. The development of learning tools in this study uses the ADDIE model, which consists of 5 stages of development: analysis, design, development and implementation, and evaluation. The effectiveness of the learning model is described based on data on the achievement of student learning outcomes, namely the mastery of concepts in the Material Theme 6 "*Cita-citaku*". Data was collected through tests, safety, and questionnaire. Effectiveness analysis data was determined through the results of the test scores of learning outcomes, student activity, and student response to the Mordiscvein learning model. The test data were analyzed using paired T-test and N-Gain analysis.

3. Results and Discussion

3.1. Learning Model Structure of Mordiscvein

The first stage of the Mordiscvein model is the *opening surprise*, where students will take a roll of paper that has been provided by the teacher. The roll of paper is really written with one word that will be solved by the students themselves about the word. One word written on the roll of paper is part of the material that will be discussed together on that day. For example, types of animals and plants that undergo changes in shape. After that, students will discuss in groups the words in the paper roll. Each member of the group must provide input or suggestions about the word that is written on the roll of paper.

The second stage of *ice Breaking*. Determining the formulation of problems and hypotheses is done through *ice breaking* activities by providing songs that are tailored to the material to be delivered (sing together). In singing the song, the bias is also not adjusted to the material. The song is free in accordance with the wishes of the students. Thus, the students in learning do not feel any pressure from the teacher. *Ice breaking* activities are led by teachers. The game starts when the song stops and the teacher's hand leads to the intended group. Then the group is obliged to read the results of their discussion in the form of identification of the

problems they have compiled and so on until all the groups convey the results of their group work. In accordance with the opinion (Hartati et al., 2020), the skill of working together is practiced through activities in group learning activities.

The third stage is to formulate experimental steps by means of the relay, followed by experiments. In this third stage, the students formulate the steps of the experiment based on the problems that have been shared by the teacher. In this phase, students are trained to be able to draw up their own steps of activities that they will do in the group using their own language. At the time of preparation of these experimental steps, the teacher will act as a facilitator in observing each student's performance.

In this phase, students are trained to think about how to structure the steps of experimental activities, accustoming students to discover for themselves, not necessarily everything from the teacher, in accordance with the theory of learning constructivism if the conclusion is drawn that knowledge comes from the student's own thinking, while the teacher is only a facilitator for students as stated by Damopolii et al. (2020) the constructivism approach, the strategy for acquiring something is crucial than the amount of knowledge acquired by the student.

Learning should encourage students to think critically about problems in learning. Teachers must be able to observe and measure students' critical thinking skills. The learning process should be able to improve the critical thinking skills of learners. Thinking skills are one of the important skills that need to be improved in the 21st century.

The fourth phase is the publication of data. Each group will publish the results that they have been able to go through the work of the group in accordance with the problems written in the initial phase of the opening surprise. For example, the group obtained the word Grasshopper, meaning that all members of the group will cooperate with each other to discuss the Grasshopper, as students know. In this phase, students are also trained to develop their potential in thinking to be able to appear in front of the class in publishing the work of their group, in accordance with the 21st-century learning, where students are required to have learning skills and innovation, which is related to the ability to think critically as stated by Hartati et al., 2020 that in this 21st Century Learning, students are required to have the ability to have freedom of thought in a learning process. In this publication activity, students submit it in accordance with LKPD orders that have been distributed by teachers.

The fifth stage is to determine the facts through the 'Rise Hand' method; the students guess the sentence that will be delivered by the teacher. In the delivery of the sentence containing material that has been taught by the teacher then, students are asked to determine whether the sentence is fact or not. If the sentence is a fact, then the student raises his right hand; if the sentence is not a fact, then the student raises his left hand. Then in answering, the fact or not must be accompanied by the reason. Thus, students did not just guess whether the sentence belonged to the category of facts or not. The purpose of this phase is that students are expected to be able to relate the facts and the reasons by using their own sentences before being assisted by the teacher. This phase will show students' enthusiasm about struggling to answer the teacher's questions in determining the facts or not.

The last stage is the sixth to string keywords into conclusions. In the learning model, concluding activities is the teacher's duty. In contrast, Mordiscvein learning model, the students themselves will conduct conclusion activities, but the withdrawal of the conclusion is only in the form of one keyword. For instance, the keyword corresponds to the one on the grasshopper paper roll. Hence, each group will conclude according to the word on the roll of paper. After the student concludes, the teacher will add the answers to the results of the conclusions of all groups.

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The results of the trial in the school SDN 2 Primary School in Limboto showed that the pretest (initial test) of 57.32%, and the post-test (final test) of 74.64%. Overall in limited trials, the improvement of student learning outcomes varies between limited trials. The average value of N-Gain is included in the high category with a value of 0.75. If it is certified to 75% with the N-Gain category, the percentage is effective.

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Figure diagram 4.6 shows an increase in Test learning outcomes for school SDN 15 Limboto, where the results of the pretest (initial test) of 46.07 and the post-test (final test) of 80.00. Overall, in the extensive trials for SDN 15, Limboto varied. The average value of the N-Gain score is included in the high category with a value of 0.66 medium.

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