TEACHER STRATEGIES USING QUANTUM LEARNING TO IMPROVE SCIENCE LEARNING OUTCOMES IN CLASS IV OF ELEMENTARY SCHOOL OF GMIM 1 KAKASKASEN

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Abstract. The research aims to improve science learning outcomes using the Quantum Learning strategy for fourth-grade students at Elementary School GMIM I Kakaskasen. This type of research uses Classroom Action Research (PTK), which consists of 4 stages, namely: 1) Planning, 2) Implementation, 3) observation, and 4) reflection. The subjects of this research were fourth-grade elementary school students. Techniques for collecting data are Observation and tests. These techniques are considered appropriate to the background of the science learning process with material on the structure and function of stems in plants using the Quantum Learning strategy. The research results showed that in the first cycle, the learning outcomes were 73.33% complete, and in the second cycle, it was 92.38%. So, it can be concluded that by implementing the Quantum Learning strategy.

INTRODUCTION

Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System in Chapter II Article 3, which states that national education functions to develop abilities and shape the character and civilization of a dignified nation to educate the nation's life, aiming to develop the potential of students to become worthy human beings, have faith and devotion to God Almighty, have noble character, be healthy, knowledgeable, capable, creative, independent, and be democratic and responsible citizens.
Education is a process to influence students to adapt as best as possible to the environment and thus bring about changes in themselves that will enable them to function powerfully in society (Oemar Hamalik, 2001). One effort to improve the quality of education is through improving the learning process for each main learning objective (Purnasari, 2020). Natural science learning (IPA) in elementary schools emphasizes providing direct learning experiences through the use of appropriate models, methods, media and strategies, as well as developing Darmojo's scientific process skills and attitudes (Samatow, 2006; Purnasari et al., 2023).

Kemp in Ngalimun (2017) explains that a learning strategy is a learning activity that must be carried out by teachers and students so that learning objectives can be achieved effectively and efficiently. Apart from that, there is also an opinion from Sajaya in Ngalimun (2017), who says that learning strategies can be interpreted as every activity chosen, namely providing facilities or assistance to students towards achieving specific learning goals.

Using appropriate learning strategies is one of the factors for the success of a learning process (Purnasari, 2021). In the process of fourth-grade science learning activities at Elementary School GMIM 1 Kakaskasen, there were still learning strategies that needed to be more varied, where teachers often used lecture strategies, and students were still less interested in learning.

It makes learning less enjoyable, resulting in low student learning outcomes. Such circumstances also affect students' understanding of what is being studied. Students will only understand as long as the material is presented. However, after that, the students will forget because the concepts embedded in the learning process are not strong enough, and this results in low student learning outcomes, which are still below the school's KKM (minimum completeness criteria), namely 75 and of the total of 21 students, it is known that those who scored above the KKM there were 11 students and ten students still got scores below the KKM. Based on the background of the existing problems, the researchers focused on teachers' strategies for using Quantum Learning to improve science learning outcomes in class IV of Elementary School GMIM 1 Kakaskasen.

**RESEARCH METHODS**

In line with the problem that is the focus of the research, namely, to improve science learning outcomes using the Quantum Learning strategy, the research was carried out using the Classroom Action Research method. The research method used in the research is Collaborative.
Classroom Action Research (PTK), Suhardjono & Supardi (in Arikunto 2008).

According to Kemmis (1988), action research is a form of reflective research carried out by participants in social situations (including education) to change their practices, thereby obtaining a comparative understanding of the practice and the situation in which the practice is carried out. Furthermore, Sarwiji Suwandi (2009) stated that classroom action research aims to improve the quality of classroom learning practices. In the PTK research used, the cycle model will be used.

Figure 1. PTK Cycle

The research was conducted at Elementary School (SD) GMIM 1 Kakaskasen, Kakaskasen III sub-district, North Tomohon District, Tomohon City. The research was carried out in the even semester of the 2022/2023 academic year in February 2023. The subjects of this research were class IV students at SD GMIM 1 Kakaskasen, with 21 students consisting of 11 male students and 10 female students. Data collection techniques in research were carried out using several techniques. The data collection technique used was through tests and observations carried out on class IV students at Elementary School GMIM 1 Kakaskasen in writing using student worksheets and assessment sheets.

The data obtained from the test is then calculated using the KKM (passing grade), the formula for learning completeness is as follows:

\[ KB = \frac{T}{Tt} \times 100\% \]

Note:
KB = Learning Completeness
T = Total score obtained by students
Tt = Total score

After calculating the complete learning outcomes that students have achieved, it is then seen that if 85% of students have a classical learning completeness score of 75, then one class can be said to have completed learning.

RESULTS DAN DISCUSSION

Research Results
1. CYCLE I
   a. Planning

   At this stage, the Researcher prepared a learning implementation plan using the Quantum Learning strategy, which the Researcher first used. At this stage, the Researcher prepared a learning
implementation plan using the Quantum Learning strategy, which the Researcher first used to discuss with the school, namely the class teacher and principal. Then, the action plan consists of making a lesson plan that is in line with the syllabus at Elementary School GMIM I Kakaskasen, preparing simple teaching aids pictures and planning the formation of groups into three groups consisting of 4-5 students. Then, an observation guide was also prepared to observe students' activity or ability to receive material on the structure and function of plants, with the primary material being dicot stems and monocot stems, as well as research instruments in the form of student activity sheets (LKPD).

b. Implementation

This stage is the implementation or execution of all the plans that have been made. At this stage, learning is carried out by applying Quantum Learning in natural science, learning about the structure and function of plants. The steps used in this strategy are TANDUR in Quantum Learning-based learning, as below:

1) Initial Activity

This activity was carried out by research as an educator, namely opening the lesson with greetings and prayers led by one of the students. This is done to build the characteristics of students as people who believe in God Almighty.

The teacher conveys the initial activity stages, namely observing, asking, understanding, exploring, communicating and concluding. Next, the teacher motivates students by asking students to observe the environment around the class and ask and answer questions to identify the plants there.

2) Core Activity

a) Learning Steps, 1 Quantum Learning Grow up

The teacher shows various types of plants in the schoolyard, such as roots, stems, leaves, flowers and seeds. The teacher also explains the differences between dicot and monocot stems. Apart from that, the teacher shows a picture of a tree.

b) Steps II Experiments

The teacher gives examples of plants and asks students to observe and pay attention to the stem parts of the plants carefully. The teacher also asks students to record information about the structure and function of stems in dicot and monocot stems.

c) Steps III Name it.

The teacher asks students to think and discuss the information they learned about the structure and function of stems in plants. The teacher also asked to look for the relationship between the structure and function of plant stems.

d) Steps IV Demonstrate

The teacher forms groups into
three groups and asks students to work together to study the problems that will become experimental material; the teacher also asks short questions to encourage students to think critically and creatively.

e) Steps V Repeated

The teacher distributes LKPD to students about the function of stems in plants. The teacher guides and facilitates each group experimenting and working on LKPD based on the existing LKPD key. The teacher asks students to carry out a formative test, asks students to present their work and asks other students to respond; then, the teacher also explains the experiment carried out to students who do not understand or do not yet understand. The teacher also provides examples related to everyday life, and the teacher provides rewards in the form of feedback.

f) Steps IV Celebrated

Teachers and students clap hands to celebrate success in following a lesson that has been completed well.

3) Last activity

The teacher and the students make conclusions or summaries of learning results. The teacher invites questions and answers about the material studied and allows students to express opinions about the learning that has been followed. The teacher provides motivation to the students, and then together, the teacher and students close the learning activities by singing, praying and giving greetings.

c. Observation

This observation activity was carried out with the class teacher, principal and researchers. In this stage, the teacher used the Quantum Learning strategy in science learning in class 4th grade. This strategy was carried out by starting each lesson by providing clear motivation and goals to students and providing opportunities for students to play an active role in learning. During the learning process, teachers use mind-mapping techniques and repetition of visualization (showing images) to help students understand the material well. Teachers give assignments to students to apply the concepts they have learned in everyday life. It helps students understand the material's relevance in everyday life. During learning, teachers provide continuous feedback to students through class discussions or individually; this helps students improve their understanding of the material and improve the quality of learning.

Using the Quantum Learning strategy in science learning in class IV has provided positive results. Students become more active in learning and have high motivation to learn; using mind mapping techniques, repetition, and visualization in learning has helped students understand the material better and better and is easy to remember. Giving assignments to students
to apply the concepts they have learned in everyday life has increased students' sense of relevance to the material studied.

Continuous feedback provided by teachers has helped students improve their understanding of the material and the quality of learning. The evaluation results in cycle I showed an increase in student science learning outcomes. However, some students still need to achieve the minimum target results set. The results of cycle I are shown in the following table:

Table 1. Students' results of cycle II

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Based on the table above, if the Researcher enters it into the learning mastery formula, the Researcher will get the following results:

\[
KB = \frac{\sum \text{Mark}}{T} \times 100\%
\]

\[
KB = \frac{1540}{2100} \times 100\%
\]

= 73.33%

These results show that the percentage of student learning conditions in science subjects through the Quantum Learning strategy in class IV of Elementary School GMIM I Kakaskasen is 73.33%, yet to meet the minimum completeness score. Hence, the researchers continued this research into cycle II.

d. Reflection

Based on reflections from cycle I, considerations for improvement in the next cycle are that teachers should provide more significant opportunities for students to be active in learning, help them understand the material well, and provide continuous feedback. The evaluation results in cycle I showed an increase in student science learning outcomes. However, some students still need to reach the minimum target results set. So, Cycle II was carried out again to improve students' science learning outcomes until they met the classical learning completeness standard of 85%.

2. CYCLE II
2023 | Yarona S.M., Rorimpandey, W.H.F., Teacher Strategy for Using Quantum Learning to Improve Science Learning Outcomes in Class IV of Elementary School GMIM 1 Kakaskasen

a. Planning

This activity is the same as Skills I, but researchers need to emphasize the material being taught. This stage is in line with the actions carried out in cycle I. An important note that must be considered from Cycle I is that students still need scores to reach the minimum score; for this reason, the implementation of Cycle II needs to be well-prepared to obtain satisfactory results. In cycle I, several things can be improved to improve learning quality and student learning outcomes. These things include, among others. Teachers can pay attention to differences in students' abilities and provide additional help for students who need it. A more thorough evaluation can help teachers identify areas that need to be improved in learning. Teachers can improve learning quality and student learning outcomes in cycle II. In this way, using Quantum Learning by teachers can be a more effective strategy for improving science learning outcomes in class IV.

b. Implementation

Implementation In this cycle, in line with the RPP that has been created, cycle II takes place in 1 meeting with a time allocation of 150 minutes using the steps of the Quantum Learning Strategy, namely TANDUR.

1. Initial activity

   This activity was carried out by research as an educator, namely opening the lesson with greetings and prayers led by one of the students. This was done to build students' characteristics as believers in God Almighty. The teacher conveys the activity stages of observing, asking, understanding, exploring, communicating and concluding. Next, the teacher motivates students by asking students to observe the environment around the class and ask questions about the plants there.

2. Core activities

   a) Step-step I Quantum Learning Grow

   The teacher shows various types of dicot and monocot stems in the schoolyard. The teacher also explains the differences between dicotyledonous and monocotyledon stems. Apart from that, the teacher shows a picture of a tree.

   b) Step II Experience

   The teacher gives examples of plants and asks students to observe and pay attention to the stem parts of the plants carefully. The teacher also asks students to record information about the structure and function of the stems in dicotyledonous and monocotyledon stems.

   c) Step III Name it.

   The teacher asks students to think and discuss the information they have learned about the structure and function of stems in plants. The teacher also asks them to look for the relationship between the structure and function of plant stems.
d) Step IV Demonstrate
   The teacher facilitates discussions between students about plant structure and function concepts. Teachers also ask questions to encourage students to think critically and creatively about the concepts being taught.

e) Step V Repeat
   The teacher distributes LKPD and LP to students about the function of stems in plants. The teacher guides and facilitates each student in working on the LKPD and LP based on the existing LKPD and LP keys. The teacher allows students to do a project by pasting each picture of dicot stems and monocot stems in front of the class.

f) Step IV Celebrate
   The teacher asks the students to do a project by sticking each picture of dicot stems and monocot stems in front of the class, and the students respond with a positive attitude that they enjoy doing it. It can be seen that they have already understood what plants are included as dicot plants and herbs. Teachers and students clap hands to celebrate success in learning.

3. End activities
   The teacher, together with the students, makes conclusions or summaries of learning results, invites questions and answers about the material studied, and gives students the opportunity to express opinions about the learning that has been followed. The teacher motivates the students, and then together, the teacher and students close the learning activities by singing, praying and giving greetings.

c. Observation
   The teacher uses the Quantum Learning Strategy in science learning in class IV. This approach is carried out by starting each lesson by providing clear motivation and goals to students and providing opportunities for students to participate in learning actively. During the learning process, teachers use mind-mapping techniques, repetition, visualization, and gamification (thinking games) to help students understand the material better. Teachers give assignments to students to apply the concepts they have learned in everyday life. It helps students understand the material's relevance in their daily lives. During learning, teachers provide continuous feedback to students through class discussions or individually. It helps students to improve their understanding of the material and improve the quality of learning. The evaluation results at the end of cycle II showed increased student science learning outcomes.

   Based on observation findings in cycle II, using TANDUR in the Quantum Learning strategy by teachers has positively
improved students' science learning outcomes in grade 4 elementary school. Teachers' learning strategies provide more significant opportunities for students to be active in learning and help them understand the material better. With continuous feedback, students can also improve their understanding of the material and overall learning quality. The increase in students' science learning outcomes at the end of cycle II shows that using Quantum Learning by teachers is an effective strategy for improving science learning outcomes in class IV.

d. Reflection

In this reflection stage, the data obtained is from the results of overall observations in the teaching and learning process during the implementation of cycle II actions. After reviewing student learning outcomes, student learning outcomes experienced an increase in the achievement of all students, reaching 92.38%. These results were achieved because there are learning strategies used by teachers who use the Quantum Learning strategy using TANDUR steps, which provide more significant opportunities for students to be active in learning, help them understand the material well and provide continuous feedback so that students look very enthusiastic in responding and accepting the learning provided by the teacher. The results of cycle II are shown in table 2 below:

Table 2. Students' results of cycle II

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Based on Table 2 above, if the Researcher enters it into the learning mastery formula, the Researcher will get the following results:

\[ KB = \frac{T}{R} \times 100\% \]

\[ KB = \frac{1540}{1540} \times 100\% = 92.38\% \]

The results of students' learning...
completeness in science subjects through the Quantum Learning strategy were 92.38%. Besides that, the learning results of all students also showed that as many as 21 students had completed learning the structure and function of stems in plants.

Discussion

According to Supradi in 2006 in Jalil (2014), citing Mc Niiff, who views PTK (Classroom Actions Research) as a form of reflective research carried out by educators (teachers) themselves regarding the curriculum, school developments improving learning outcomes, developing teaching skills and continuous. This research aims to improve science learning outcomes using the Quantum Learning strategy for fourth-grade students at Elementary School GMIM I Kakaskasen. In the science learning process for fourth-grade students at Elementary School GMIM I Kakaskasen, some students still need help understanding the material. For this reason, science learning needs to use Quantum Learning strategies to engage students in the learning process actively.

This research was conducted in a dual implementation cycle consisting of four stages: planning, implementation, action, Observation and Reflection. In implementing cycle I, the score obtained by students reached 73.33% because the students needed to understand the material properly, and the teacher also needed an approach to the students. Based on the problems above, the Researcher continued the second cycle. In cycle II, learning experienced an increase from cycle I because students played an active role in learning, and the teacher's approach to students was practical and motivational. The feedback given by the teacher to students made an increase in learning outcomes in cycle II, which was effective, and the results were good. Achieved in science learning, namely 92.38%, which means that implementing the teacher's strategy using Quantum Learning for class IV students at SD GMIM I Kakaskasen has been successful.

CONCLUSION

Based on the description of the research results and discussion presented, the Quantum Learning strategy approach can improve student learning outcomes in grade IV science subjects at Elementary School GMIM I Kakaskasen. Science learning using the Quantum Learning strategy makes students active, creative and able to work together in groups and can train students to think critically.

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