



The Influence of the Inquiry Based Learning on the Learning Outcomes (Cognitive, Affective and Psychomotor) of Elementary School Students

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ABSTRACT	ARTICLE INFO
<p><i>IPAS learning in elementary schools played an important role in developing students' critical thinking, attitudes, and skills. This research was motivated by the low learning outcomes of fifth-grade students at SD Negeri 5 Kawan Bangli, which were influenced by the dominance of conventional teaching methods that tended to make students passive during the learning process. The study aimed to determine the effect of the inquiry based learning on students' learning outcomes in IPAS subjects. This study employed a quantitative approach with a quasi-experimental design. The research subjects consisted of an experimental class taught using the inquiry based learning and a control class taught using conventional learning methods. Data were collected through cognitive tests as well as observations for affective and psychomotor aspects. The collected data were analyzed using the Independent Sample T-Test. The results showed a significant difference between the learning outcomes of students in the experimental class and those in the control class. This finding was indicated by a significance value of $0.000 < 0.05$ and a higher mean score achieved by the experimental class compared to the control class. Therefore, it was concluded that the inquiry based learning significantly affected the learning outcomes of fifth-grade students in IPAS subjects at SD Negeri 5 Kawan Bangli</i></p> <p>© 2026 UPI Journal and Publication Office</p>	<p>Article History: Submitted/Received 09 Jan 2026 First Revised 01 Feb 2026 Accepted 14 Mar 2026 First Available online 17 Mar 2026 Publication Date 01 Jun 2026</p> <hr/> <p>Keywords: <i>Inquiry Based Learning; Learning Outcomes; IPAS</i></p>

1. INTRODUCTION

Education affects the development of a nation, especially in improving the quality of the people who live in it. Ki Hajar Dewantara as mentioned in the work, explained that education is the process of guiding all abilities and potentials that exist in children, so that students can grow as whole human beings as well as people who are able to achieve the highest happiness. Meanwhile, according to education, it is a process that takes place continuously without limited place and time, with the aim of directing humans to improve their quality of life. This meaning is strengthened by Chapter I Article 1 which explains that: "Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble morals, and the skills needed by themselves, society, nation and state" (Citriadin, 2019; Marfu'ah, 2021) Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System

One of the levels of formal education in Indonesia is elementary school. Elementary school serves as the main foundation for the formation of students' character, as well as building the basics of knowledge and skills, an important effort in the formation of individuals who are intelligent, independent, and have noble morals. According to , elementary school is a very important educational phase in instilling the value of independence as one of the main elements in character formation. According to , the age between 6 and 12 years old enters the primary school period, and the developmental characteristics at that age form the basis of learning activities in elementary school. Students in elementary schools learn various main fields of study, including IPAS (Azzahra et al., 2023; Rahmi & Hijriati, 2021)

Science learning in elementary schools is an integration of science and social studies concepts. Social studies learning aims to enable students to understand how humans relate to nature, as well as hone their critical thinking acumen and solve problems based on real facts in the field. According to him, social studies learning cannot be carried out only by relying on lecture methods, but students need to be actively involved in learning activities through experiments, observations, and experiments. In this case, educators have a very crucial role as a guide and facilitate meaningful learning, so that students better understand the natural and social events around them (Iffah et al., 2024). However, the fact is that social studies learning often faces various challenges, such as the application of conventional learning models, low student participation in concept exploration, and low learning outcomes.

Data available in the *Programme for International Student Assessment (PISA)* in 2022, confirms the achievement of science learning outcomes of Indonesian students of 383, which shows a decrease compared to the previous period. A similar phenomenon also occurred at SD Negeri 5 Kawan Bangli, the researcher carried out observations and interviews with educators and several class V students. Based on the results of observations made during the learning process, it was found that most students still had difficulties in understanding the social studies material taught. Students tend to be less active in learning activities, such as asking questions, expressing opinions, and discussing with group friends. In addition, when the teacher gave a question, only some students were able to answer well, while other students looked passive and lacked confidence. The results of interviews with classroom teachers also show that students often have difficulties in understanding learning concepts because learning is still dominated by lecture methods and the use of less varied learning models. This condition causes students to be less interested in participating in learning, which has an impact on the low learning outcomes of IPAS students in class V at SD Negeri 5 Kawan Bangli. The action that can be taken is to apply a student-centered learning model (OECD, 2023)

The application of the inquiry learning model is an alternative solution to this problem.

The inquiry learning model is expected to be an alternative solution to optimize the quality of IPAS teaching through contextual and interactive approaches. Students not only receive knowledge conceptually, but also connect it with real experiences and the surrounding environment. Therefore, this study aims to examine the effect of the application of the inquiry learning model on the learning outcomes of grade V students at SD Negeri 5 Kawan Bangli, especially in the material "Why Do We Need to Eat and Drink?". This study is expected to provide theoretical and practical meaning for the implementation of an effective innovative learning model, oriented towards improving student learning outcomes.

2. RESEARCH METHODS

The research was carried out in class V of SD Negeri 5 Kawan Bangli, by applying a *quasi-experiment* design which is a type of quantitative study (Saputri & Mardiyati, 2025). The researcher applied the *Post-Test Only Control Design*, which focused on comparing the *post-test achievements* between the two classes after receiving treatment. The sample in this study was divided into two groups, namely the VB group with 29 participants as an experimental class that was given the application of an inquiry learning model. In contrast, the VA group of control classes with a conventional learning approach, consisted of 30 participants (Scott, 2023).

Data collection in this study was used multiple-choice tests and observations. The test is given after the entire learning process is over, to determine the cognitive learning achievements of students. Meanwhile, observation is carried out during learning activities, in order to find out learning outcomes in affective and psychomotor aspects. The test instrument is validated first through several tests including 1) the validity of the content by the expert, 2) the validity of the item, 3) the difficulty of the test, 4) the differentiating power of the question, 5) the power of deception or distractor, and 6) reliability.

Description of learning achievement data between classes using mean measures. Before further analysis, the data were tested for normality prerequisites to verify distribution as well as homogeneity for similarity of variance. If the data meet the normal and homogeneous requirements, hypothesis analysis is continued using the IBM 26.0 SPSS-assisted *independent sample t-test for detection of significant differences* between groups. The selection of this technique ensures the validity and conformity of the results with empirical data.

3. RESULTS AND DISCUSSION

3.1. Description of Experimental Class and Control Class Post-Test Data

The learning outcomes of students in the experimental and control classes were determined through the implementation of *post-tests* after the two classes received different learning treatments. The scores obtained were analyzed to determine the achievement of the level of achievement of students' learning competencies in the material "Why Do We Need to Eat and Drink?". In addition, the percentage of learning success is calculated to see the overall students who meet the completeness criteria. These results provide an overview of the level of learning success in both classes. The following are the post-test results in the table below:

Table 1 Post-Test Results and Data Centering Size

Remarks	Experimental Classes	Control Class
Number of Students	29	30
Conclusion	24	12
Incomplete	5	18
Completion Percentage	82,76%	40,00%
Percentage Not Completed	17,24%	60,00%

Mean	85,24	76,27
Median	84	76
Mode	84	76
Maximum Value	96	88
Minimum Grade	72	64
Variance	42,40	36,34
Standard Deviation	6,51	6,03

Based on the data in the table, there is a real difference in learning outcomes between the two classes. In the experimental class, 24 participants managed to achieve completeness, while only 5 participants did not complete. On the other hand, in the control class, there were 12 participants who had completed and 18 participants who had not yet reached completion. In terms of data center size, the experimental class recorded an average score of 85.24, higher than the control class with an average of 76.27. The median and mode of the experimental class were also larger than those of the control class. Furthermore, the highest score in the experimental class reached 96, while in the control class it was only 88.

Based on the post-test results obtained, students in the experimental class showed better cognitive learning outcomes than the control class. The difference in post-test results between the experimental class and the control class showed that the application of the inquiry learning model had a positive influence on students' cognitive learning outcomes. Students in the experimental class were seen to be more able to understand the material "Why Do We Need to Eat and Drink?" because during the learning process they were actively involved in observing, discussing, and discovering learning concepts independently. The involvement of students in the learning process helps students understand the material more deeply so that the learning results obtained are more optimal. On the other hand, in the control class, students tend to only accept explanations from the teacher, so that involvement in learning is lower. This condition causes students' concept understanding in the control class to not develop optimally compared to the experimental class. These differences indicate significant variations in students' learning abilities in the material "Why Do We Need to Eat and Drink?" as a result of different learning treatments.

3.2. Description of Affective Observation Data of Experimental Class and Control Class

Data on student learning outcomes in affective aspects were collected through observations carried out during learning in experimental and control classes. The observation aims to raise students' attitudes when participating in learning material on the digestive system. The data obtained were then analyzed to identify the development of students' learning attitudes and their level of participation in learning activities. The results of observations of the students' affective aspects are summarized in the following table:

Table 2 Affective Observation Results and Data Centering Measures

Remarks	Experimental Classes	Control Class
Number of Students	29	30
Excellent	6	1
Good	22	18
Enough	1	11
Excellent Percentages	20,69%	3,33%
Good Percentage	75,86%	60,00%
Sufficient Percentage	3,45%	36,67%
Mean	80,41	74,27

Median	80	74
Mode	80	74
Highest Score	92	86
Lowest Score	68	62
Variance	36,97	36,34
Standard Deviation	6,08	6,03

The data in the table shows a clear disparity in the results of affective domain observation between the two classes. In the experimental class, most of the students were classified as good to very good, with only 1 person in the sufficient category. Likewise with the control class, which still has 11 people in the sufficient category. Based on the data concentration indicator, the experimental class obtained a mean of 80.41, exceeding the control class which recorded a mean of 74.27. In addition, the median and mode of the experimental class were recorded to be larger than that of the control class, with the highest score of 92 in the experimental class compared to 86 in the control class.

The results of affective observation showed that students in the experimental class had a better learning attitude than the control class. The difference in affective observation results between the experimental class and the control class showed that the inquiry learning model was able to improve students' learning attitudes during the learning process. Students in the experimental class seemed more active in discussing, daring to express opinions, and showing high enthusiasm when participating in learning. In addition, students were also seen to be able to work together and respect the opinions of their friends during group activities. Learning activities that directly involve students make the learning atmosphere more interactive and encourage students to actively participate. On the other hand, students in the control class tend to be less active because learning is more dominated by the teacher's explanations so that students' interaction and participation in learning are more limited. Thus, the application of the inquiry learning model is able to have a positive influence on the development of students' learning attitudes in the affective realm.

3.3. Description of Psychomotor Observation Data of Experimental Class and Control Class

Data on learning outcomes in the psychomotor domain were collected through observations carried out throughout learning in experimental and control classes. The observation aims to improve the competence of students in carrying out learning activities related to the material "Why Do We Need to Eat and Drink?". Furthermore, the data obtained is analyzed to identify the progress of students' competencies and the degree of their ability to complete learning tasks. The results of the students' psychomotor observations are summarized in the following table:

Table 3 Psychomotor Observation Results and Data Centering Measures

Remarks	Experimental Classes	Control Class
Number of Students	29	30
Excellent	5	0
Good	19	19
Enough	5	11
Excellent Percentages	17,24%	0%
Good Percentage	68,79%	63,33%
Sufficient Percentage	17,24%	36,67%

Mean	78,41	72,27
Median	78	72
Mode	78	72
Highest Score	90	84
Lowest Score	66	60
Variance	36,97	36,34
Standard Deviation	6,08	6,03

From the table presented, there is a real difference in the results of psychomotor observations between the experimental and control classes. In the experimental class, most of the students were included in the good to very good achievements, although a small number were still in the sufficient category. In contrast, the control class recorded 11 people in the adequate category, without any students achieving the very good category. Based on the concentration of statistical data, the experimental class recorded an average of 78.41, which was superior to the control class with an average of 72.27. The median and mode of the experimental class were also higher than those of the control class. Furthermore, the maximum score of the experimental class reached 90, while the control class was only 84.

Based on the results of psychomotor observations, students in the experimental class showed better learning skills than the control class. The difference in the results of psychomotor observations between the experimental class and the control class showed that the inquiry learning model was able to help improve students' skills in the learning process. Students in the experimental class looked more skilled in making observations, discussing, conveying the results of group work, and completing the learning tasks given. The direct involvement of students in each stage of learning provides opportunities for students to develop learning skills more optimally. In addition, students also seem more active and confident while participating in learning activities. On the other hand, in the control class, students listen more to the teacher's explanations, so that the opportunity to develop learning skills is more limited than in the experimental class. This difference indicates the effectiveness of the inquiry learning model in optimizing students' skills during learning activities in the material "Why Do We Need to Eat and Drink?".

3.4. Normality Test

The normality test was carried out to determine whether the learning achievement data of students in the experimental and control classes followed the normal distribution before testing the hypothesis. This analysis applied *the Shapiro-Wilk* test assisted by *IBM 26.0 for Windows SPSS* on *post-test* data, affective observation, and psychomotor. The decision-making criteria are based on a significance threshold of 0.05, a significance value of > 0.05 indicates a normal distribution, while < 0.05 indicates abnormal. For *post-test* data, the significance of the experimental class was 0.148 and the control class was 0.215 (both > 0.05), so that it was declared normal.

In affective observation data, the experimental class recorded a significance of 0.219, while the control class 0.215, these values met the threshold of > 0.05 , stating the normality of the data distribution. Similarly, the normality test of psychomotor observation data yielded a significance of 0.219 in the experimental class and 0.215 in the control class, both of which were > 0.05 , so that the data was normally distributed. Overall, this test concluded that the learning outcome data on cognitive, affective, and psychomotor aspects of both classes had met the normality prerequisites, making them adequate for further analysis.

3.5. Homogeneity Test

Homogeneity testing was carried out to verify the equivalence of variance in student learning achievement data between the experimental class and the control class. This procedure is an essential prerequisite before applying a parametric hypothesis test. The analysis was conducted using *SPSS IBM 26.0 for Windows*, provided that the data is homogeneous if the significance value (sig.) > 0.05 . In the post-test data, the results of the homogeneity test recorded a significance of 0.532 (> 0.05), so the variance was declared homogeneous. For affective observation data, a significance of 0.958 (> 0.05) confirmed the homogeneity of the variant. Similarly, psychomotor observation data obtained a significance of 0.958 (> 0.05), indicating homogeneity. The findings show that the variants of learning achievement data in the cognitive, affective, and psychomotor domains between the two classes are homogeneous. Therefore, the data meets the assumption to carry out hypothesis testing through parametric analysis, i.e. *an independent test of the sample t-test*.

3.6. Hypothesis Test

After the data met the requirements for normality and homogeneity, the next stage was hypothesis testing using an independent sample t-test with the help of the IBM 26.0 SPSS application for Windows. This test aims to determine the difference in learning outcomes between the experimental class that receives treatment through the application of the inquiry learning model and the VA class as a control class that uses a conventional learning model. The processed data included cognitive, affective, and psychomotor aspects. The results of *the independent sample t-test* in the three domains obtained a significance value (Sig. 2-tailed) of 0.000 (< 0.05). These results indicate that there was a significant difference between the experimental class and the control class in all aspects of the learning outcomes evaluated.

3.7. Discussion

This discussion aims to review and interpret findings related to student learning outcomes. Research shows that the implementation of the inquiry learning model significantly affects students' learning abilities in the cognitive, affective, and psychomotor domains. This conclusion is based on data analysis as well as hypothesis testing that has been carried out. The inquiry learning model has been proven to be effective in comprehensively improving students' learning abilities, including not only test scores but also attitudes and competencies during the learning process.

The data description showed that the average learning outcomes of the experimental class students were consistently higher than that of the control class in all domains. In the cognitive domain, the experimental class recorded an average of 85.24, while the control class recorded 76.27. For the affective domain, the average experimental class was 80.41 compared to 74.27 in the control class. In the psychomotor domain, the average score of the experimental class of 78.41 exceeded the 72.27 of the control class. This comparison underscores the superiority of the ability of the students of the experimental class. In addition, hypothesis testing yielded a significance (Sig. 2-tailed) of 0.000 (< 0.05), so that H_0 was rejected and H_a accepted, stating a significant difference between classes.

In the cognitive realm, students in the experimental class obtained higher learning outcomes than the control class. These differences show that the inquiry learning model is able to help students understand the concept of learning more deeply. During the learning process, students in the experimental class are actively involved in observing, questioning, discussing, and finding learning concepts independently. This active involvement helps students build their

own knowledge so that learning materials become easier to understand. On the other hand, in the learning control class, it is more dominated by the teacher's explanations so that students tend to be passive and do not explore the learning material independently.

In the affective realm, students in the experimental class showed a better learning attitude than the control class. During the learning, students seemed more enthusiastic in participating in learning activities, actively discussing, daring to express opinions, and being able to work together with their group friends. Learning activities that involve students directly make students more motivated and more active in the learning process. On the other hand, students in the control class tend to be less active because learning is more teacher-centered, so that students' interaction and participation in learning becomes more limited. This condition causes the development of students' learning attitudes in the control class to not develop optimally compared to the experimental class.

In the psychomotor realm, students in the experimental class also showed better learning skills than the control class. Students in the experimental class were seen to be more skilled in making observations, conveying the results of discussions, working together in groups, and completing the learning tasks given. This happens because the inquiry learning model provides opportunities for students to be directly involved in each stage of learning. This involvement helps students develop learning skills more optimally. On the other hand, in the control class, students listen more to the teacher's explanations, so that opportunities to develop learning skills are more limited.

Observations during learning show that experimental classes display more active, interactive, and student-centered learning dynamics. Students seemed more enthusiastic in discussing, asking questions, expressing opinions, and working together in groups during the learning process. The active learning atmosphere provides opportunities for students to build an understanding of concepts independently through research and discovery activities. On the other hand, in the learning control class, it tends to take place in one direction so that students are more passive in receiving learning materials. These differences in learning activities contribute to differences in student learning outcomes in the cognitive, affective, and psychomotor domains.

The findings of this study are supported by the theory of constructivism put forward by Jean Piaget, which states that knowledge is actively built by learners through direct learning experiences. In the inquiry learning model, students not only receive information from the teacher, but also engage in the process of observing, questioning, investigating, and drawing conclusions independently. This process helps students build a more meaningful understanding of concepts so that it has an impact on improving student learning outcomes, especially in the cognitive realm. In addition, the active involvement of students during the learning process also encourages students to be more enthusiastic, confident, and active in learning activities so that learning outcomes in the affective and psychomotor domains also increase.

The results of this research are also relevant to the discovery learning theory put forward by Jerome Bruner. According to Bruner, learning will be more meaningful if students discover the concept of learning for themselves through the process of exploration and problem-solving. In the application of the inquiry learning model, students are given the opportunity to seek information, discuss, and find learning concepts independently so that students' critical thinking skills can develop optimally. In addition to improving thinking skills, these learning activities also help students develop cooperative skills, communication, and learning skills during the learning process.

The results of this study are in line with research conducted by those who show that the inquiry learning model has a significant effect on the learning outcomes of science

students in elementary school. The research also states that the inquiry learning model is able to improve students' activities and learning outcomes because students are actively involved in the learning process. In addition, research shows that inquiry learning can improve students' critical thinking, cooperation, and skills during the learning process. The similarity of the results of the study shows that the inquiry learning model is one of the learning models that is effectively applied to science studies learning in elementary schools. (Putri Pikrin & Sutarna, 2025; Sigalingging et al., 2022; Tarigan et al., 2023).

Overall, the average analysis and hypothesis confirm the significant influence of the inquiry learning model on the learning outcomes of grade V IPAS students at SD Negeri 5 Kawan Bangli. The consistency of differences in the cognitive, affective, and psychomotor domains indicates more active, meaningful, and student-centered learning activities, thus proving the hypothesis empirically.

4. CONCLUSION

Based on data analysis and research findings, the inquiry learning model has been proven to have a significant influence on the learning achievement of grade V students in science subjects at SD Negeri 5 Kawan Bangli. This evidence was obtained from *an independent test of a t-test* with a significance (Sig. 2-tailed) of 0.000 (< 0.05), so that H_0 was rejected and H_a was accepted. The average learning outcomes of students in the experimental class were consistently superior to those of the control class in the cognitive, affective and psychomotor domains. Observations of the learning process confirmed that the experimental class displayed higher engagement, conducive dynamics, and superior activity than the control class. In the experimental class, students seemed enthusiastic in discussion, asking questions, collaborating, and constructing independent concepts through inquiry. On the other hand, in the control class, participants were taught more passively due to the dominance of conventional approaches. Thus, the inquiry model is effective in optimizing the quality of learning and learning outcomes in all three domains.

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