**Indonesian Journal of Education & Mathematical Science**
Vol. 5, No. 2, Mei 2024, pp. 64~73
ISSN: 2715-985X, DOI: 10.30596/ijems.v5i2.17645

# Pond-based Scientific Approach and Learning Motivation on Student Learning Outcomes

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## ABSTRACT

The pond-based scientific approach is a scientific approach for students in the aquaculture area, which requires the support of local wisdom-based learning media. With the many scientific approaches that exist, it does not make it difficult for students to raise local wisdom, namely aquaculture, to be used as research in obtaining student learning outcomes. The scientific approach can also provide learning motivation to students so that students are motivated to study harder in lifting student learning outcomes. This study aims to determine the literature review related to the pond-based scientific approach and learning motivation in improving student learning outcomes. The research method chosen is descriptive quantitative by first testing validity, reliability, classical assumptions, partial (t) and simultaneous (f) testing using the help of SPSS Ver,-2023 software for windows. Data collection was carried out by interview, documentation and questionnaires distributed to respondents who had a population of 200 respondents of SDN 37 Bulu-Bulu, Pangkajene District and the sample was taken by random sampling using 15% of the population totaling 30 respondents of SDN Bulu-bulu students, Pangkajene District, Pangkep Regency. The results of the study partially test or test (t) and simultaneous test (f) pond-based scientific approach has a significant effect on student learning outcomes SDN 37 Bulu-bulu Pangkajene District Pangkep Regency. Then the partial test or test (t) or simultaneous test (f) student learning motivation has a significant effect on the learning outcomes of students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency.

**Keywords: Scientific Approach, Learning Motivation and Learning Outcomes**

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## 1. INTRODUCTION

Education has an important role in creating quality Indonesian human resources. Efforts to improve human quality are aimed at realizing the nation's successors who will carry out future development. The successor of a qualified nation or known as human resources is what determines the success of development. For this reason, one way to create quality human resources is through education by (Mukhriddin Sodirjonov, 2020).

The quality of education is the quality of education that can be seen from graduates of that education because only quality education produces education graduates who are able to build themselves, families, communities, nations and countries. Students must also play an active role in education, because education requires teachers, students, facilities and infrastructure. The teacher in question is a teacher who is professional and competent in his field by (Vanderlinde, et al, 2021).

Teachers in teaching must be good at using a wise and wise approach, not carelessly which can harm students. The teacher's view of students will determine attitudes and actions. Every teacher does not always have the same view in terms of assessing students. This will affect the approach the teacher takes in teaching. Because the success or failure in a teaching and learning process depends on how the teacher chooses a good approach by (Bukit, et al, 2022).

Student success in the learning process can be influenced by factors from within the individual and from outside the individual. Factors from within the individual include physical and psychological, for example psychological factors including motivation. Student learning motivation can support learning success, but low student motivation is an obstacle that can result in low learning

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outcomes. For this reason, teachers must be able to choose the right model or method in order to create an interesting learning situation so that it can foster learning motivation and student success in learning is achieved by (Erick Marantika and wahyudin, 2023).

The scientific approach in learning as intended includes observing, questioning, collecting data, associating and communicating, so that students not only know facts or principles, but must be skilled in applying their knowledge in life by (Fitrah, et al, 2023).

Based on initial observations at the research location, it shows that as follows: (1) the learning model is still much dominated by the teacher so that students are less active in following the learning, (2) the method used in learning that focuses on the cultivation of information or concepts learned are told or presented with lectures only; (3) in the process of integrated thematic learning students feel less direction and guidance in independent learning, (4) in the implementation of learning teachers still apply book notes until exhausted, and (5) student learning outcomes have not been satisfactory which is dominated by the achievement of learning outcomes on average 70 percent learning completeness.

Also supported by the results of social studies learning in the last five years from the 2018 to 2022 school year as follows:

**Table 1. Percentage of Grade VI social studies learning outcomes in the last 5 years**

| 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|
| **73,50%** | 73,56% | 73,72% | 73,75% | 73,75% |

Source: *School Data SDN 37 Bulu-Bulu Pangkajene, 2022*

From table 1. it provides a picture that is still less than the maximum student learning completeness, with an indicator that from a student population of 215 children who have experienced the learning process, the percentage of children who already have a learning completeness value or the score meets the minimum completeness criteria set by the teacher is an average of 75%.

These conditions as a result of evaluating the learning process, apparently have not had a good impact on increasing student motivation and learning outcomes. This is because the learning process carried out is still using methods and models that do not attract students' attention, so that a learning model that is creative and involves students in learning through a pond-based scientific approach is needed, in the archipelago where SDN 37 Bulu-Bulu Kec. Pangkajene Pangkajene Islands Regency is located.

Some research results that link the relationship between the scientific approach and learning outcomes are research that aims to determine the effect of Indonesian language textbooks with a scientific approach on student learning outcomes in scientific writing in terms of students' academic ability. This research is a pseudo-experimental research by (Suprihatin, et al, 2023). Where previous research explains the effect of Indonesian language textbooks using a scientific approach that has a significant impact on student learning outcomes in line with our research on Pond-Based Scientific Approach and Learning Motivation affecting Student Learning Outcomes the existence of pond-based scientific knowledge coupled with high motivation from students will greatly impact the learning outcomes of students of SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency. Then learning motivation to learning outcomes is a study that aims to determine the relationship between learning independence and learning motivation with social studies learning outcomes. This research uses an experimental method with an associative quantitative approach, which explains whether or not there is an influence between various variables based on the size of the correlation coefficient. This research was conducted on grade V students in the first semester of SD Gugus V Ciracas District, East Jakarta in the 2022/2023 school year by (Sulaksana, et al, 2023). Where in previous studies, learning independence really helped students to be more independent in learning coupled with student learning

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motivation will have a significant impact on the learning outcomes of SD Gugus V, Ciracas District, East Jakarta. In line with our research that the Pond-Based Scientific Approach and Student Learning Motivation affect Student Learning Outcomes with the existence of pond-based scientific knowledge through independent learning coupled with the existence of high motivation from students, it will greatly impact the learning outcomes of students of SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency.

## 2. RESEARCH METHODS

The research was conducted at SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency in June - July 2023. The research population can be interpreted as the whole of the object of research focus is all 200 students at SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency. The sampling technique in this study was random sampling (randomly) totaling 30 students of SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency consisting of class IV students with 10 students, class V with 10 students and class VI students with 10 students using the Slovin formula theory (Slovin, 1960). Here is a picture of the sample of student respondents of SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency.

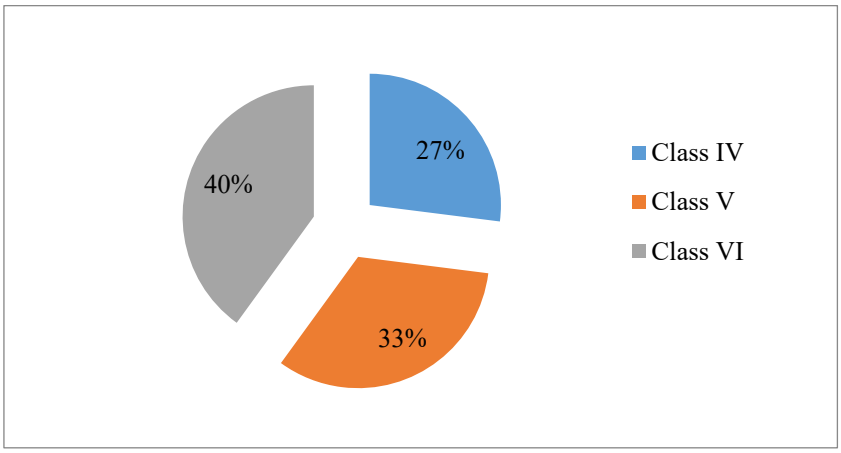



**Fig 1. Population and Sample Data (Random Sampling)**
Source: *Data processed by student respondents of SDN 37 Bulu-Bulu, Pangkajenen District, Pangkep Regency, 2023*

From the figure above with a population of 200 students of SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency, with a sample of 30 SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency consisting of grade IV students of 8 students or 27%, grade V students of 10 students or 33% and grade VI students of 12 students or 40%. Data collection in this study used a questionnaire method. Respondents' answers were measured using a 5-point Likert scale. The data analysis technique uses multiple linear regression using the SPSS software program which first tests validity, reliability, classical assumptions, simultaneous F test and partial t test.

## 3. RESULTS AND DISCUSSION

This section describes the results of research consisting of validity, reliability, classical assumption tests, multiple regression tests and hypothesis tests as well as research discussions.

### A. Validity Testing

Testing using the first SPSS software program validity is a test used to measure the instrument in the questionnaire and can be used to measure what should be measured by (Wainer and Braun, 2013). The validity test is used to measure the validity of a questionnaire, a questionnaire is declared valid if the questions / statements on the questionnaire are able to reveal something that will be measured by the questionnaire. The validity test can be used a correlation coefficient whose

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significant value is less than 5% (level of significance) indicates that the question / statement has been declared valid as an indicator shaper. The test results are obtained as follows:

**Table 2. Validity Test Results**

| Variable | t-count | Description |
|---|---|---|
| **Scientific Approach** | 0,699 | Valid |
| **Learning Motivation** | 0,687 | Valid |
| **Learning Outcomes** | 0,710 | Valid |

Source: *Data processed SPSS Ver Program, 2023*

The validity test results show that all question/statement items to measure the scientific approach variable (X.1), learning motivation (X.2), and learning outcomes (Y) in this study have a correlation coefficient greater than $t_{table}$ = 1.70 (ttable value for n = 30). So, it can be concluded that all items in the indicator questions/statements of the scientific approach variable (X.1), learning motivation (X.2), and learning outcomes (Y) of SDN 37 Bulu-Bulu, Pangkajene District, Pangkep Regency are valid.

**B. Reliability Testing**

The second test Reliability is how much the degree of the test measures consistently the target being measured. Reliability is expressed in numerical form, usually as a coefficient. A high coefficient means high reliability by (Julie Pallant, 2020). A questionnaire is declared reliable if someone's answer to a statement is consistent or stable over time. Testing the reliability in this study is to use the alpha formula. The results of the reliability test for each variable obtained the following data:

**Table 3. Reliability Test Results**

| Variable | Cronbach's Alpha if Item Deleted | Description |
|---|---|---|
| **Scientific Approach** | 0,789 | Reliabel |
| **Learning Motivation** | 0,880 | Reliabel |
| **Learning Outcomes** | 0,910 | Reliabel |

Source: *Data processed SPSS Ver Program, 2023*

The results of the reliability test show that the questions/statements for the variable value of the scientific approach items, learning motivation and learning outcomes of students of SDN 37 Pangkajene District, Pangkep Regency have a Cronbach's Alpha value at . 990 and Cronbach's Alpha If Item Deleted above 0.7 and above the rtable value of 0.30 (rtable value for n = 30) and so it can be stated that the question / statement items for the scientific approach variable, learning motivation and student learning outcomes of SDN 37 Pangkajene District, Pangkep Regency as a data collection tool and as a measuring tool.

**C. Classical Assumption Testing**

The classical assumption test is a requirement that must be met in the OLS linear regression model so that the model becomes valid as an estimation tool by (Billy Nugraha, 2022). The following table tests normality, linearity and the coefficient of determination:

**Indonesian Journal of Education & Mathematical Science**
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**Table 4. Normality Test Results**

| Variable | Sig (2-tailed) | Decision | Description |
|---|---|---|---|
| **Scientific Approach** | 0,390 | >0,05 | Normal |
| **Learning Motivation** | 0,364 | >0,05 | Normal |
| **Learning Outcomes** | 0,529 | >0,05 | Normal |

Source: *Data processed SPSS Ver Program, 2023*

The results of the data normality test with Kolmogorov-Smirnov by comparing the probability number value or Asymp. Sig (2-tailed) with a significance level of 0.05 or 5% with decision making if the significance value is less than 0.05 or 5% then the data distribution is abnormal. Based on the calculation of the SPSS software program for the scientific approach variable, learning motivation, and learning outcomes of SDN 37 Bulu-bulu students, Pangkajene District, Pangkep Regency, the probability value or Asymp. Sig (2-tailed) with a significance level above 0.05 or 5%, the data is declared normally distributed. The following table 5. linearity test data.

**Table 5. Linearity Test Results**

| Variable | Uji F | Deviation From Linearity | Decision | Description |
|---|---|---|---|---|
| **Scientific approach > Learning Outcomes** | 1.533 | 0.161 | 0.161 > 0.05 | Linier |
| **Learning Motivation > Learning Outcomes** | 1.445 | 0.281 | 0.281 > 0.05 | Linier |

Source: *Data processed SPSS Ver Program, 2023*

The results of the linearity test between the learning outcomes variable and the scientific approach obtained the deviation from linearity sig value is 0.161 greater than the sig value of 0.05, it can be concluded that there is a linear relationship between the scientific approach and learning outcomes. As well as the learning motivation variable and learning outcomes obtained the deviation from linearity sig value is 0.281 greater than the sig value of 0.05, it can be concluded that there is a linear relationship between learning motivation and learning outcomes.

**Table 6. Test Results of The Coefficient of Determination**

| Variable | Coefficient's Determination Value ($R^2$) | Description |
|---|---|---|
| **Scientific Approach** | 0.845 | Independent |
| **Learning Motivation** | | |
| **Learning Outcomes** | | Dependent |

Source: *Data processed SPSS Ver Program, 2023*

The results of testing the value of the coefficient of determination (R2) and the error variable (e) In the calculation of the total coefficient of determination obtained of 0.845, it is concluded that 84.5% of the learning outcomes variable of SDN 37 Bulu-bulu students in Pangkajene District, Pangkep Regency is directly influenced by the scientific approach and learning motivation while the remaining 15.5% is influenced by other factors not included in the research model or outside the research model.

**Indonesian Journal of Education & Mathematical Science**
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### D. Multiple Regression Testing

Multiple regression testing is a statistical technique that simultaneously develops a mathematical relationship between two or more independent variables and the dependent variable (Billy Nugraha, 2022). The following are the results of the partial t-test multiple regression test as follows:

**Table 3. F-Test Results (Simultaneous Test)**

**ANOVA[A]**

| MODEL | | Sum of Squares | df | Mean Square | F | Sig. | F-TABEL |
|---|---|---|---|---|---|---|---|
| 1 | Regression | 147.791 | 2 | 492.264 | 18.684 | .000 | **3.33** |
| | Residual | 253.119 | 96 | 2.637 | | | |
| | Total | 400.910 | 99 | | | | |

**A.DEPENDENT VARIABLE: LEARNING OUTCOME**

**B.INDEPENDENT VARIABLE: SCIENTIFIC APPROACH AND LEARNING MOTIVATION**

Source: *Data processed SPSS Ver Program, 2023*

From the table above, the simultaneous test above together shows a regression value of 147.791, residual 253.119, df 2, mean square 49.264, the value of f count is 18.684 with sig.000 which means that together directly the scientific approach and learning motivation have a direct and significant influence on student learning outcomes. The following are the results of the partial t-test multiple regression test as follows:

**Table 4. T-Test Results (Partial Test)**

**COEFFICIENTS[A]**

| MODEL | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | T-TABEL |
|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | |
| 1 | (Constant) | 3.877 | .994 | | 20.793 | 0.183 | **1.70** |
| | Scientific Approach | 1.241 | .043 | 0.798 | 31.233 | 0.001 | |
| | Learning Motivation | 3.170 | .059 | 0.355 | 23.441 | 0.005 | |

**DEPENDENT VARIABLE: LEARNING OUTCOME**

Source: *Data processed SPSS Ver Program, 2023*

From the table above, partial testing, the structural equation can be formulated as follows: Y1 = 0.798 X1 + 0.355 X2 e1 The structural equation can be interpreted as: (1) The scientific approach has a t value coefficient of 31.233 with a sig of 0.001 <0.005 which means that the scientific approach has a significant effect on student learning outcomes, meaning that if the scientific approach increases, it has an impact on improving student learning outcomes. (2) Learning motivation has a t value coefficient of 23.441 with sig 0.005 - 0.005 which means that learning motivation has a significant effect on student learning outcomes, meaning that the higher the learning motivation, the higher the student learning outcomes.

**Indonesian Journal of Education & Mathematical Science**
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ISSN: 2715-985X, DOI: 10.30596/ijems.v5i2.17645

### E. Hypothesis Test

**Hypothesis 1**

Based on hypothesis testing, it is proven by the t-value of 31.233> 1.96 with Sig 0.001 <0.05 (5%), this shows that the scientific approach has a significant effect on student learning outcomes, which means that the first hypothesis is accepted.

**Hypothesis 2**

Based on hypothesis testing, it is evidenced by a t-value of 34.441> 1.96 with Sig 0.005 - 0.05 (5%), this shows that learning motivation has a significant effect on student learning outcomes, which means that the second hypothesis is accepted.

**Hypothesis 3**

Based on hypothesis testing together, it is proven by a square value of 492.264. f-value of 18.684 and a significance of 0.000 <0.005 (5%), this shows that together the scientific approach and learning motivation have a significant effect on student learning outcomes, which means that the third hypothesis is accepted.

## DISCUSSION

### A. The Effect of the Scientific Approach on Student Learning Outcomes

The scientific approach is a learning process designed in such a way that students actively construct concepts, laws or principles through the stages of observing (to identify or find problems), formulating problems, asking questions or proposing hypotheses, collecting data with various techniques, analyzing data, drawing conclusions and communicating concepts, laws or principles found by (Bairagi and Munot, 2019). So it is concluded that the scientific approach is based on several steps, namely 1) Observe (to identify or find problems), 2) formulate problems, 3) propose and formulate hypotheses, 4) collect data with various techniques, 5) analyze data, 6) draw conclusions and 7) communicate concepts. Communicating concepts.

The results showed that the scientific approach through partial testing had a significant effect on the learning outcomes of students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency with a beta value of 0.798 with a t-value of 31.233> 1.96 significance 0.001. This means that if the scientific approach will be enabled, it will affect student learning outcomes. The achievement of student learning outcomes is inseparable from how the scientific approach used by students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency is based on ponds. Where the scientific approach of ponds through students is able to develop the potential in themselves in order to become human beings who are knowledgeable, critical, characterized, creative and fact-based thinking that can provide reinforcement at SDN 37 Bulu-bulu Pangkajene District Pangkep Regency. If you look at the results of research showing that the pond-based scientific approach has a significant effect on student learning outcomes, then SDN 37 Bulu-bulu Pangkajene Sub-district, Pangkep Regency by raising student learning outcomes through intellectual skills, cognitive strategies, attitudes, verbal information and motor skills.

The results of testing the final stage of the pond-based scientific approach consist of indicators that students are able to develop potential in themselves in order to become knowledgeable humans, with critical, character, creative and fact-based thinking which requires SDN 37 Bulu-bulu Pangkajene District Pangkep Regency to apply this pond-based scientific approach method at school. Furthermore, student learning outcomes with intellectual skills where each student learner needs to show intellectual operations that can be shown and performed, cognitive strategies that students need to show complex performances in a new situation, where little guidance is given in choosing and applying previously learned rules and concepts, attitudes of students learners need to provide behavior that reflects the choice of action towards science activities, verbal information students learners need to have verbal knowledge that can be stored as a network of propositions and motor skills students learners not only include physical activities but motor activities combined with intellectual skills.

In line with several studies that emphasize the scientific approach to student learning outcomes, among others, the research results are: 1) Indonesian language textbooks with a scientific approach affect student learning outcomes in the psychomotor and affective domains; 2) academic ability has no effect on student learning outcomes in writing scientific papers, and 3) the interaction between Indonesian language textbooks with a scientific approach and academic ability has no effect on student learning outcomes in scientific writing by (Suprihatin, et al, 2023). Furthermore, research on the use of e-plantbooks in the learning process can encourage student-centered learning because students are more active and students can learn independently by (Magfiroh, et al, 2023).

**B. The Effect of Learning Motivation on Student Learning Outcomes**

Learning motivation is an encouragement from within students and stimuli from outside students that cause changes in behavior to achieve a certain goal. it is concluded that learning motivation is an encouragement that arises both from within and outside the student, which is able to generate enthusiasm and enthusiasm for learning and provide direction to learning activities so that the desired goals can be achieved by (Hoffman, 2015).

The results showed that learning motivation through partial testing had a significant and significant effect on the learning outcomes of students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency with a beta value of 0.355 with a t-value of 23.441> 1.96 significance 0.005. This means that if learning motivation will be enabled, it will affect student learning outcomes. The achievement of student learning outcomes is inseparable from how the learning motivation of students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency is based on ponds. Where learning motivation through the desire to succeed, needs in learning, ideals, appreciation and learning environment. If you look at the results of research showing that learning motivation has a significant effect on student learning outcomes, then SDN 37 Bulu-bulu Pangkajene District Pangkep Regency by raising student learning outcomes through intellectual skills, cognitive strategies, attitudes, verbal information and motor skills.

The results of testing the final stage of learning motivation consist of indicators of the desire to succeed, every student must want to succeed in everything they do, then the need to learn is important for students to meet their every need, the ideals of every student need to get appreciation because moving on from dreams needs to be supported and realized, It is also necessary for students to be rewarded for what they have done and it is also necessary to be supported by a comfortable and adequate learning environment to help students in receiving well the lessons at school requires SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency to be able to provide space and infrastructure for students to be able to explore their abilities according to their respective fields which in turn can improve student learning outcomes through intellectual skills, cognitive strategies, attitudes, verbal information and motor skills.

In line with several studies, among others, the results of the analysis show that the level of learning independence and learning motivation together has a strong and positive correlation with the learning achievement of fifth grade elementary school students in Gugus V, Ciracas District, East Jakarta. In other words, the higher the level of children's independence, the higher the learning achievement. Likewise with learning motivation, in turn improving learning outcomes by (Sulaksana, et al, 2023). Furthermore, the conclusion that: 1) There is a significant influence of school culture on science learning outcomes, with an influence of 42.1% and an effective contribution of 20.7%. 2) There is a significant effect of learning interest on science learning outcomes, with an effect of 44.4% and an effective contribution of 18.5%. 3) There is a significant effect of learning motivation on science learning outcomes, with an effect of 44.1% and an effective contribution of 17%. And 4) Together there is a significant influence of school culture, learning interest, and learning motivation on science learning outcomes, with an influence of 56.2% by (Purnadewi, et al, 2023).

## 4. CONCLUSION

Based on the results of the testing and discussion above, the conclusion of this study is that the pond-based scientific approach through partial tests has a significant effect on the learning outcomes of students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency, this needs to be applied and carried out by the school so that in the future the pond-based scientific approach can be applied such as knowledgeable, critical, character, creative and fact-based thinking to strengthen the students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency. Then learning motivation through partial tests has a significant effect on the learning outcomes of students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency, it needs to be maintained by the school so that the learning motivation of students with the desire to succeed, needs in learning, ideals, appreciation and learning environment can be improved again by students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency so that the targets to be achieved by the school, especially students, can be realized. As well as together the pond-based scientific approach and learning motivation test simultaneously have a significant effect on the learning outcomes of students of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency can be realized by collaborating with each other between ideas and responsive communication between students and school parties. And it is hoped that in the future for this research there will be further development.

## ACKNOWLEDGEMENTS

A big thank you to the school of SDN 37 Bulu-bulu, Pangkajene District, Pangkep Regency, especially the principal, vice principal, board of supervisors, teachers and students who have given the widest possible space to researchers, in seeing the atmosphere that occurs at school, especially in a pond-based scientific approach, good learning motivation to be applied which will significantly improve student learning outcomes.

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