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# Model Pembelajaran OIDDE pada Keterampilan Metakognitif dan Hasil Belajar Kognitif Siswa MAN 1 Bulukumba

## *OIDDE Learning Models on Metacognitive Skills and Cognitive Learning Outcomes of Man 1 Bulukumba Students*

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## Abstrak

Keterampilan metakognitif dapat menyadarkan peserta didik untuk merencanakan, mengontrol proses, mengevaluasi, merefleksi, termasuk menilai kelemahan dan kelebihannya. Dengan demikian memiliki keterampilan metakognitif tinggi dapat memiliki hasil belajar kognitif yang tinggi pula. Model pembelajaran OIDDE merupakan mampu meningkatkan keterampilan metakognitif yang kemudian memiliki korelasi positif dengan hasil belajar. Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran OIDDE terhadap keterampilan metakognitif dan hasil belajar kognitif pada mata pelajaran Biologi peserta didik MAN 1 Bulukumba. Penelitian ini merupakan penelitian kuantitatif yaitu penelitian eksperimen semu (*Quasi Eksperimental Design*) dengan desain *Nonequivalent Control Group*, populasi terdiri dari peserta didik MAN 1 Bulukumba kelas XI dengan jumlah 86 orang, sampel penelitian yang berjumlah 56 peserta didik yang dipilih dengan teknik *purposive sampling*. Teknik analisis data yang digunakan adalah analisis deskriptif dan analisis inferensial dengan menggunakan uji prasyarat dan uji t-test *Polled varians*. Berdasarkan hasil analisis data diperoleh keterampilan metakognitif dengan hasil rata-rata *pretest* siswa adalah 67,87 dan *posttest* adalah 83,5 dan hasil belajar dengan hasil rata-rata *pretest* siswa adalah 63,33 dan *posttest* adalah 88,23. Berdasarkan uji *t-test Polled varians* diperoleh data nilai uji dua pihak dari data keterampilan metakognitif dan hasil belajar pada kelompok kontrol dan eksperimen yaitu F = 7,48 df 56 dan *sig.* (*2-tailed*) atau *p-value* adalah 0,029 < 0,05 atau H1 ditolak dan H0 diterima. Dengan demikian, dapat disimpulkan bahwa terdapat pengaruh model pembelajaran OIDDE terhadap keterampilan metakognitif dan hasil belajar pada materi biologi siswa MAN 1 Bulukumba.

**Kata kunci**: Model Pembelajaran OIDDE; Keterampilan Metakognitif; Hasil Belajar

## *Abstract*

*Metacognitive skills can make students aware of planning, controlling the process, evaluating, and reflecting, including assessing their weaknesses and strengths. Thus having high metacognitive skills can have high cognitive learning outcomes as well. The OIDDE learning model can improve metacognitive skills, which positively correlate with learning outcomes. This study aims to determine the effect of the OIDDE Learning Model on Metacognitive Skills and Cognitive Learning Outcomes in Biology Subjects of Students in MAN 1 Bulukumba. This study used a quasi-experimental design with a non-equivalent control group. The population comprises 86 students from MAN 1 Bulukumba class XI, 56 of whom were randomly selected using the purposive selection technique. The descriptive and inferential data analysis techniques used were the preconditioning test and the Polled variance t-test. Based on the results of the data analysis, the student's metacognitive skills average pre-test was 67.87, and the post-test was 83.5. The learning outcome of the student's pre-test was 63.33, and the post-test was 88.23. The t-test of the Polled variance showed a value of F = 7.48 of 56 and sig. (2-tailed) or p-was 0.029<0.05. It may be inferred that the OIDDE learning model affects students in MAN 1 Bulukumba's metacognitive capabilities and learning outcomes in biology subjects.*

***Keywords***: *OIDDE Learning Models; Metacognitive Skills, Learning Outcomes*

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## INTRODUCTION

The elements in schools must be able to be equipped and used to support the learning process. The school is commonly acknowledged as a system of several components. The principal, school committee. Each learning activity has learning objectives that must be achieved to obtain the predicate of successful learning, all parties involved in learning have a role in achieving this success (Ernanda et al, 2022). Teachers, students, curriculum, and educational facilities. These elements are interconnected and influence each other to achieve goals, particularly in the learning process (Priarti, 2017). Various learning challenges cannot be separated from implementing teaching and learning process activities. Knowledge, understanding, attitudes and behavior, skills, capacities, creative capacity, acceptance, or everything that exists or occurs in the individual can all be seen as a product of the learning process (Syafni, Syukur & Ibrahim, 2013).

Learning problems experienced by students are closely related to learning skills. Educators must able to be critical to analyze the learning needs of students in the classroom (Triyanto & Prabowo, 2020). Learning problems encountered by students are closely associated with learning skills. The phenomenon reveals that many students lack learning skills (Syafni, Syukur & Ibrahim, 2013). The weak competence of teachers in the learning process, such as a lack of ability to apply models and media to support learning activities, impacts students' incapacity to grasp how to think, which is linked to learning outcomes. (Freire, 2000). It is in line with Atika, Sudana & Basyirun (2017) regarding teacher readiness, learning resources, infrastructure, and facilities. Overall, the most significant factor is teachers' willingness to educate by incorporating more students to allow them more freedom of thinking.

Several skills are needed in the learning process since they control what students learn, one of which is metacognitive skills (Iskandar, 2014). This skill usually involves a person's ability to think and act. It implies that metacognitive skills are related to a person's cognitive capacity (Sudjana & Wijayanti, 2018). Improving metacognitive skills will have an impact on cognitive learning outcomes increasing (Adnan & Bahri, 2018; Setiawan et al., 2020).

Metacognitive skills are needed to achieve learning outcomes following the Minimum Completion Criteria (KKM). Iskandar, 2014 suggested a positive correlation between metacognitive skills and learning outcomes. His study shows that metacognitive skills significantly impact cognitive learning outcomes in scientific learning. It proves that practicing metacognitive skills helps motivate students to learn, organize, manage, measure their learning capacities, and reflect on their knowledge, including identifying their weaknesses and strengths (Camahalan, 2000).

Based on preliminary observations conducted on July 12th, 2019, at MAN 1 Bulukumba, a biology teacher Ms. Nurwahyuni, S. Pd, revealed that the learning process was still teacher-centered. There were still many students who did not recognize their thinking skills. She said during the learning process, students only wrote what the teacher said and did not try to think outside the box. The students can not connect the topic with another topic. The learning outcomes are low and do not reach the Minimum Completion Criteria (KKM) value of 72. The data showed that only 27% of the students fulfilled the criteria. According to Mr. Didi, S. Pd., another biology teacher, the students were still at a low level of thinking and could not recognize their learning strategies.

So, there were low learning outcomes based on the observations. Improving students' metacognitive skills was necessary to increase their learning achievement. According to Livingston (2019), metacognitive activities take the form of task planning, checking to understand, and evaluating progress, all of which can help students actively regulate their cognitive processes. Therefore, students who have high metacognitive skills can guarantee high cognitive learning outcomes.

Biology as science provides a variety of learning experiences to understand scientific concepts and processes. Biology is concerned with how to learn about nature methodically. Thus, it is knowledge in the form of facts, ideas, and principles and a discovery process (Depdiknas, 2006). Biology learning emphasizes providing direct learning experiences through the use and development of process skills and scientific attitudes, including thinking skills (metacognitive).

The learning model has been developed and implemented as a learning step in the classroom. The OIDDE learning model, which stands for Orientation, Identify, Discussion, Decision, and Engage in performance, is one of the most current learning models established to improve metacognitive skills. It has a good connection with learning outcomes (engaging in behavior) (Hudha, Amin, Bambang & Akbar, 2018). The model supports the theory to increase students' activities to find and solve problems. The students are also encouraged to have an ethical attitude, make ethical considerations, and improve their metacognitive skills (Husamah, Fatmawati & Styawan, 2018). Based on these descriptions, this study was conducted on the effect of the OIDDE learning model on metacognitive skills and student learning outcomes.

## METHOD

This research is a non-equivalent control group design. It was used to obtain a causal relationship between experimental and control groups (Mustami, 2015). The population in this study was 86 students of class XI MAN 1 Bulukumba. The sampling technique used is purposive sampling. As mentioned in Creswell (2015), the sample is defined by particular criteria that align with the research objectives to answer research questions. This is a multistage random sampling

methodology based on stratified divisions and then randomly drawn for each. The intention is for each sample in a given area to have the same chance of becoming a respondent.

The study's independent variable is the ODDIE learning model, which is observed with an observation sheet as the instrument. The instrument was developed based on implementing the ODDIE model's learning lesson plan or RPP. The dependent variables were metacognitive skills and the learning outcome. The metacognitive skills were observed with an essay test developed under the revised Bloom's taxonomy level. The metacognitive skills score rubric linked to the essay test biological concept and adapted from Corebima consists of 7 scales (0-7) as a reference for checking the answers to each test item. Students' metacognitive skills were also measured using the Metacognitive Skills Inventory (MSI), adapted from MAI by Schraw & Dennison and SEMLIS-S. A multiple-choice test is used to assess learning results. The descriptive and inferential data analysis techniques employed were preconditioning and polled variance t-tests.

## RESULT AND DISCUSSION

### Result

The data collection process for each classroom meeting followed health protocol due to the pandemic.

### Metacognitive Skills Using the OIDDE Learning Model in Biology Subjects for Students in MAN 1 Bulukumba

**Table 1.** The Mean Pre-test and Post-test of Students' Metacognitive Skills in the Experiment Class

| Descriptive Statistics | Pre-test | Post-test |
|---|---|---|
| Number of samples | 30 | 30 |
| Maximum score | 75 | 91 |
| Minimum score | 57 | 79 |
| Average | 67,87 | 83,50 |
| Standard deviation | 4,703 | 3,330 |
| Variance | 68,00 | 83,00 |

As seen in Table 1 that, the students' metacognitive skills in the pre-test experimental class have the lowest score of 57 and the highest score of 78. The average value of the pre-test is 67.87, with a standard deviation of 4.703 (moderate category). Meanwhile, the data variable of students' metacognitive skills in the post-test experimental class had the lowest score of 79 and the highest score of 91. The average value was 83.5, with a standard deviation of 3,330 (high category).

### Metacognitive Skills without Using the OIDDE Learning Model in Biology Subjects for Students in MAN 1 Bulukumba

**Table 2.** The Mean Pre-test and Post-test of Students' Metacognitive Skills in the Control Class

| Descriptive Statistics | Pre-test | Post-test |
|---|---|---|

| | | |
|---|---|---|
| Number of samples | 26 | 26 |
| Maximum score | 74 | 80 |
| Minimum score | 54 | 62 |
| Average | 64,69 | 72,42 |
| Standard deviation | 5,136 | 4,365 |
| Variance | 65,0 | 71,50 |

Table 2 showed that the students' metacognitive skills in the pre-test control had the lowest score of 54 and the highest score of 74. The average value was 64.69, with a standard deviation of 5.136 (moderate category). In the post-test control class, the lowest score was 62, and the highest score was 80. The average value of the post-test results was 83.5, with a standard deviation of 4.365 (high category).

**Learning Outcomes Using the OIDDE Learning Model in Biology Subject for Students in MAN 1 Bulukumba**

**Table 3.** The Average Pre-test and Post-test of Students' Learning Outcomes in the Experiment Class

| **Descriptive Statistics** | **Pre-test** | **Post-test** |
|---|---|---|
| Number of samples | 30 | 30 |
| Maximum score | 75 | 96 |
| Minimum score | 53 | 83 |
| Average | 63,33 | 88,23 |
| Standard deviation | 5,054 | 3,025 |
| Variance | 62,50 | 87,00 |

Based on Table 3, the student's learning outcome in the pre-test experimental class has the lowest value of 53 and the highest value of 75. The average value of the pre-test results was 63.33, and a standard deviation value of 5.054 (medium category). Meanwhile, the value of the post-test experimental class has the lowest score of 83 and the highest of 96. The average value of the post-test was 88.23, and a standard deviation value of 3.025 (very high category).

**Learning Outcomes without Using the OIDDE Learning Model in Biology Subject for Students in MAN 1 Bulukumba**

**Table 4.** The Average Pre-test and Post-test of Students' Learning Outcomes in the Control Class

| **Descriptive Statistics** | **Pre-test** | **Post-test** |
|---|---|---|
| Number of samples | 26 | 26 |
| Maximum score | 75 | 81 |
| Minimum score | 25 | 50 |
| Average | 59,85 | 72,54 |
| Standard deviation | 9,784 | 7,564 |
| Variance | 62,00 | 75,50 |

In Table 4, the student learning outcome in the pre-test control class has the lowest value of 25 and the maximum value of 75. The average value of the pre-test results was 59.85 and a standard deviation of 9.784 (moderate category). Additionally, the student learning outcome in the post-test control class has the lowest score of 50 and the highest score of 81. The average value of the post-test results was 88.23, with a standard deviation is 3.025 (high category).

**The Effect of the OIDDE Learning Model on Metacognitive Skills and Learning Outcomes of Students in MAN 1 Bulukumba in Biology Subjects**

**Normality Test**

**Table 5.** Normality Test Results (Kolmogorov-Smirnov)

| **Class** | ***Kolmogorof Smirnov*** | | | **Information** |
|---|---|---|---|---|
| | Statistic | Df | Sig. | |
| **Control (XI IPA 3)** | 0.165 | 26 | 0.066 | Normal |
| **Experiment (XI IPA 2)** | 0.127 | 30 | 0.200 | Normal |

Based on Table 5, the significant value of class XI IPA 3 as the control class was 0.066 with a df value of 26. Class XI IPA 2, as the experimental class, has a significant deal of 0.200 with a df value of 30. As a result, if the values were significantly larger than 0.05, the data were normally distributed.

**Homogeneity Test**

**Table 6.** The Levene's Test of Equality of Error Variance

| ***Levene's Test of Equality of Error Variances*** | | | |
|---|---|---|---|
| Dependent Variable:<br>Biological Value<br>(Metacognitive Skill and Learning Outcomes) | | | |
| F | df1 | df2 | Sig. |
| 2.335 | 2 | 83 | 0.103 |

Table 6 shows Levene's Test of Equality of Error Variances obtained an F value of 2,335 with a significance value of 0.103. The data met homogeneity since the significance value was 0.103> 0.05.

**Hypothesis testing**

**Table 7.** Hypothesis Test Results (Polled variance t-test)

| **Data** | ***Uji – t Polled Variants*** | |
|---|---|---|
| **Class** | **Control** | **Experiment** |

| Mean | Metacognitive Skill | Learning Outcomes | Metacognitive Skill | Learning Outcomes |
|---|---|---|---|---|
| | 72,42 | 72,54 | 83,50 | 88,23 |
| **A** | 0,05 | | | |
| **Sig (2-tailed)** | 0,029 | | | |
| **Conclusion** | There is a Difference | | | |

Based on Table 7 above, the two-sided test value from metacognitive skills and learning outcomes in the control and the experimental class was 0.029. The two-sided test value was smaller than the significant value (0.029 <0.05), meaning there was a significant difference in the average value of metacognitive skills and learning outcomes for both groups. It was known that the average post-test experimental group score on metacognitive skills was 83.50, and the learning outcome was 88.23. At the same time, the post-test control group has 72.42 for metacognitive skills and 72.54 for learning outcomes. So that there is an effect of the OIDDE learning model on metacognitive skills and student learning results in class XI IPA 2 as an experimental class.

## Discussion

### The effect of the OIDDE Learning Model on Metacognitive Skills and Learning Outcomes measured by a rubric

Based on the study, the OIDDE learning model successfully increased metacognitive skills and student learning outcomes toward conventional learning models. It means that the model potentially empowers metacognitive skills and student learning outcomes.

The OIDDE learning model's syntax includes orientation, identification, discussion, and engagement in performance. Those allowed each student to find information about the facts on their own. They are also entitled to analyze and synthesize the facts of the problem and then make decisions and statements as their attitude as personal engagement. The learning model OIDDE makes students use their experience and knowledge to find alternative solutions and actions for themselves and others (Hudha, Amin, Bambang & Akbar, 2018). Therefore, a connection of metacognitive skills supports student learning activities.

The OIDDE learning model also plays a role in improving thinking skills. It's known the model encourages students to carry out learning activities. When learning activities are integrated into knowledge improvement, they become more connected to students' daily experiences (Husamah, Fatmawati & Styawan, 2018).

### The effect of the OIDDE Learning Model on Metacognitive Skills measured by the Metacognitive Skill Inventory (MSI)

Based on the study, the learning model did not affect students' metacognitive skills as measured using the Metacognitive Skill Inventory (MSI). In addition, the study's results also showed differences

in metacognitive skill scores between students with high academic abilities and those with lower intellectual abilities.

The results of this study differed from the results of the ANACOVA skills test, which were measured using a rubric. There are score differences in students' metacognitive skills taught using conventional learning models and OIDDE learning models. The difference is due to the insignificant difference of instruments variable used to assess the metacognitive skill where the Metacognitive Skill Inventory (MSI) was adapted from the Metacognitive Awareness Inventory (MAI). According to Corebima, the cause of the insignificant influence of strategies and learning models on metacognition skills, as shown in the MAI instrument, is due to the unavailable of the instrument for the Indonesian population. Based on this, Corebima developed a metacognitive measurement tool integrated with the achievement test (Bahri & Corebima, 2015).

A previous study by Arsad Bahri also showed that measuring students' metacognitive skills using MSI gave a different tendency from measuring their variables. The corrected mean scores of students with lower academic abilities were higher than students with higher ones. (Bahri, 2015). A similar result was also stated by Schraw & Dennison that metacognitive is about awareness and skills regarding a person's strengths and weaknesses as well as strategies and models and their use (Schraw & Dennison, 1990).

The study showed a difference in students' metacognitive skills in the ANACOVA test of rubric and MSI. The learning outcome variable test found a significant correlation with metacognitive skills measured with the rubric. However, the correlation of metacognitive skills measured using the MSI showed no significant correlation. It implied that it is less precise and less ideal to use inventory to measure metacognitive skills, even though the instrument has passed the validation process.

**Metacognitive Skills and Student Learning Outcomes are taught without using the OIDDE Learning Model**

For the control class (XI IPA 3) that taught using conventional learning models, the data for metacognitive skills showed the highest score of 80, the lowest score of 62, and the average score of 72.42 with a standard deviation of 4.365. Meanwhile, the learning outcomes have the highest score of 81, the lowest score of 50, and the average score of 72.54, with a standard deviation of 7.564. It appears that metacognitive skills and learning outcomes in the control class (XI IPA 3) do in the high category.

These findings were relevant to Andhyta Desi Wulansari, that said the conventional learning model is a teaching and learning activity that many teachers have been implementing. Therefore the teacher's activities dominate the classroom. As a consequence, students accept whatever the teacher conveys. The students are not active in expressing their opinions and participating in activities, so they become passive in learning. This conventional learning model does not provide enough attention to developing students' competencies (Wulansari, 2014).

According to Nasution in Zulyadini, conventional learning models have unspecific learning achievements. The learning materials are also in groups without paying attention to students individually (Zulyadini, 2016). In other words, the conventional learning model is only teacher-centered and does not pay attention to students, so students become passive in classrooms instead of active.

## CONCLUSION

Due to hypothesis testing of the Polled variance t-test obtained sig (2-tailed) or p-value less than 0.05, namely 0.029 <0.05 or H1 rejected, and H0 is accepted. The OIDDE learning model apparently affected metacognitive skills and learning outcomes in class XI IPA 2 students in MAN 1 Bulukumba. For further research, it is suggested to use the Metacognition Awareness Inventory (MAI) developed by Schraw and Dennison (1994) in measuring students' metacognitive skills, considering that there are more items in the instrument. This can enrich the findings of the application of the ODDIE learning model to metacognitive skills and learning outcomes in students.

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