THE EFFECTIVENESS OF GIVING QUIZ AT THE BEGINNING OF LEARNING IN THE DISCOVERY LEARNING MODEL TOWARD LEARNING OUTCOMES STUDENTS ON BUFFER SOLUTION MATERIA IN CLASS XI IPA OF SMA NEGERI 3 PANGKEP *(Times .*

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Abstract

A quiz at the beginning of learning is very important to assess students' learning readiness. Readiness to learn is a condition that must be owned by students because it will make it easier for students to accept and understand the material presented. Good learning readiness will also encourage students to be active in the learning process to improve student learning outcomes. This study aims to determine the level of effectiveness of giving quizzes at the beginning of quiz-assisted learning in the discovery learning model on student learning outcomes in the buffer solution material. This research was conducted at SMA Negeri 3 Pangkep in class XI IPA 2 with a total of 30 students. Data collection is done by presenting a quiz at the beginning of each lesson, a final test as an evaluation, observing student activities, and observing the implementation of learning. Data analysis used descriptive statistical analysis. Learning is said to be effective if students' learning outcomes are at an N-gain of 0.3 to 1.00. Based on the results of data analysis, it was concluded that giving quiz at the beginning of learning in the discovery learning model toward learning outcomes students on buffer solution materia in class XI IPA of SMA Negeri 3 Pangkep was effective. With an N-gain value of 0.45 in the medium category.

Keywords: Quiz, Quizizz, Discovery Learning, Learning Outcomes

INTRODUCTION

Education is one of the main objectives in preparing better quality human resources in the future. Education is an important part of the national development process which contributes to increasing a country's economic growth. Education is also an investment in human resource development. Education is a need that cannot be separated from human life. Therefore education needs to be developed because quality education can increase the intelligence of a nation.

Every individual will always experience a learning process in his life. Learning will enable individuals to experience changes in themselves. This change can be in the form of mastering a certain skill, changing attitudes, and having different knowledge before carrying out the learning process. In all efforts to achieve educational goals, the learning process is the most important activity because it is in this process that educational goals can be achieved. The learning process can be said to be successful if it has achieved educational goals. This success can be seen in the learning process and student learning outcomes. Therefore, to achieve this, the readiness of students is needed.

In the teaching and learning process, individual readiness as a student will determine the quality and learning outcomes [1]. Readiness in Slameto (2013) is defined as the overall condition of a person who makes him ready to respond or answer in a certain way to certain situations [2]. Giving quizzes can be done on the learning model of discovery learning. Readiness to learn is a condition that must be possessed by students because it will make it easier for students to receive and understand the material presented. Readiness to learn will determine the quality of the learning process and student learning outcomes. Readiness

factors according to Djamarah (2011) include: a) Physical readiness, for example, the body is not sick (far from being lethargic, drowsy, and so on) [3]. b) Psychological readiness, for example, there is a desire to learn, one can concentrate, and there is intrinsic motivation. c) Material readiness, for example, there is material to be studied or worked on in the form of reading books and notes.

Buffer solutions are one of the most difficult chemicals. In this material students are required to have a strong conceptual understanding and must be able to apply existing formulas. Buffer solutions have characteristics that are abstract in the acid-base reaction section, understanding the concept of buffer solutions, mathematical in the calculation of the pH of the buffer solution, and applicative in the function of the buffer solution [4]. So in the buffer solution material, students must prioritize understanding concepts. Therefore, if students' learning readiness is lacking, it will greatly affect student learning outcomes. This can be seen from the scores of students in the odd semester at SMA Negeri 3 Pangkep for the 2020/2021 school year, only 50% of students achieved completeness with scores above the KKM.

One way that can be used to assess students' learning readiness from the aspect of knowledge is by giving quizzes. This is supported by Subana (2000) who states that one of the learning methods that can encourage students to learn and can make students active to improve learning outcomes is giving quizzes [5]. Giving quizzes at the beginning of learning can increase students' enthusiasm for learning to be actively involved in the learning process so that they can achieve the expected student learning outcomes (Nurfahraini et al, 2020). This explanation is supported by Sutardi (2013) who stated that the increase in learning outcomes occurs because giving quizzes at the beginning of learning can make students more enthusiastic so that they can encourage students to take part in each learning activity [6].

Giving quizzes can be done on the learning model of discovery learning. According to (Permendikbud, 2014) the learning model of discovery learning directs students to understand concepts, meanings, and relationships, through an intuitive process to finally conclude. The discovery of concepts is not presented in its final form, but students are encouraged to identify what they want to know and continue to search for information themselves, then organize or construct what they know and understand in a final form. The discovery learning modeling quizzes given at the beginning of learning can be used to optimize learning outcomes that focus on understanding concepts by way of discovery. By providing opportunities for students to ask and answer questions that arise after the quiz is given, learning interactions in class will continue to increase thereby increasing students' learning abilities. So that the learning model of discovery learning and giving quizzes given at the beginning of learning can be used to optimize learning outcomes that focus on understanding concepts by way of discovery. By providing opportunities for students to ask and answer questions that arise after the quiz is given, learning interactions in class will continue to increase thereby increasing students' learning abilities [7].

One of the e-learning that can be used and is currently available that can be used to give quizzes at the beginning of learning to students is quizizz. The use of quizizz -based learning media can be a good alternative to use in assessing student learning readiness. Giving quizzes at the beginning of learning to see the readiness of students in learning can use quizizz. Quizizz is a game-based educational application that brings multiplayer activities into the classroom and makes classroom learning more fun and interactive [8]. Quizizz can be used as an alternative learning medium for educators to carry out daily assessments. Quizizz is quite easy for educators to operate when acting as problem-makers and student users when working on questions [9]. Data collection techniques and data analysis in this study are as follows: This study aims to determine the level of effectiveness of giving quizzes at the beginning of learning assisted by quizizz media in the discovery learning model on student learning outcomes in SMA Negeri 3 Pangkep students on buffer solution material.

METHOD

This type of research is descriptive research involving one class taught by the discovery learning model. This research was conducted in the even semester of the 2021/2022 school year. The place for conducting the research was at SMA Negeri 3 Pangkep, Kec. Bungoro, Kab. Pangkajene Prov. South Sulawesi. The subjects in this study were students in class XI IPA 2 SMA Negeri 3 Pangkep in the 2021/2022 academic year with a total of 30 students. The term limits in the research are: (1) Learning is said to be effective if students' learning outcomes are at N-gain $g \geq 0.3$ to 1.00; (2) Giving quizzes at the beginning of learning is a multiple choice question given to students before the discovery learning syntax uses quizizz media. The number of quiz questions is adjusted to the number of competency achievement indicators. Giving quizzes are given every meeting before learning begins; (3) Learning outcomes are the ability of students after going through the learning process which is measured using the learning achievement test. The implementation of the learning outcomes test is carried out after each lesson is completed.

Data collection techniques and data analysis in this study are as follows: This study aims to determine the level of effectiveness of giving quizzes at the beginning of learning assisted by quizizz media in the discovery learning model on student learning outcomes in SMA Negeri 3 Pangkep students on buffer solution material.

1.   Giving Learning Readiness Quiz

Scores obtained by students are converted to grades using the formula:

$$Score = \frac{score\ Obtained}{Maximum\ Score} \times 100 \ (1)$$

The scores obtained by students are then categorized according to predetermined assessment standards. Grouping the level of learning readiness of students refers to the following table:

Table 1. Table of Standards for Learning Readiness Assessment

Mastery Level Category	Category
0-49	Very Low
50-69	Low
70-79	Moderate
80-89	High
90-100	Very High

2. Provision of Learning Outcomes Tests

To find out the value of learning outcomes obtained by students, the score is converted to a value by using the formula:

$$Score = \frac{score\ Obtained}{Maximum\ Score} \times 100 \ (2)$$

a. Individual completeness

$Tp = \frac{JB}{Js} \times 100\% \ (3)$

Information:

Tp   = Completed Individually

JB = Score of each student

Js   = Maximum score

The grouping of students' learning mastery levels is as follows:

Table 2. Classification of completeness of student learning outcomes

Completion Level	Category
≥ 77	Complete
≤ 77	Not Complete

Class completeness

$Tk = \frac{\sum Tp}{n} \times 100\% \ (4)$

Information:

Tk   = Completed Class

$\sum Tp$ = Score of each student

n   = Number of students

The class completeness criteria for the buffer solution material for SMA Negeri 3 Pangkep are as follows:

Table 3. Completeness Category Class

Completed Class	Category
$\geq 80\%$	Complete
$\leq 80\%$	Not complete

c. Indicator Completeness

$Ti = \frac{\sum Ti}{n} \times 100\% \ (5)$

Information:

Ti   : Complete Indicator

$\sum Ti$: Completed number of learners/indicator

n   : Number of students

The indicator completeness categories in the buffer solution material for SMA Negeri 3 Pangkep are as follows:

Table 4. Completeness Categories of Completed

Completed Class	Category
$\geq 77\%$	Complete
$\leq 77\%$	Not complete

d. N-Gain Test
The N-gain values obtained are then categorized based on Table 5:

Table 5. Interpretation Normalized Gain

N-Gain Score	Classification
$\geq 0,70$	High
$0,30 \leq$ n-gain $< 0,70$	Medium
$< 0,30$	Low

Based on the gain score criteria, this research is said to be effective if the learning outcomes of students obtain an n-gain score > 0.3.

e. Observation of Student
Activities Score $= \frac{F}{A} \ x \ 100\%$ (6)

Information:

F : The number of students who carry out activities in syntax

A : The total number of students who take part in learning

Table 6. Percentage of Student Activities

Average Implementation (%)	Category
85-100	Very Good
65-84	Good
55-64	Enough
35-54	Less
0-34	Bad

f. Observation of Learning Implementation
Score $= \frac{\text{the total value of each aspect}}{\text{the total number of aspects}} x 100\%$ (7)

Table 7. Guidelines for Categorizing Learning Implementation

Percentage (%)	Criteria
85-100	Very Good
65-84	Good
55-64	Enough
35-54	Less
0-34	Bad

RESULTS AND DISCUSSION

1. Research result

Descriptive statistical analysis is used to provide an overview of the characteristics of student learning outcomes. The results of the descriptive statistical analysis of the learning outcomes of class XI IPA 2 as a class taught by giving quizzes assisted by quizizz media at the beginning of learning the discovery learning model can be seen in Table 8.

Table 8. Description of Student Learning Outcomes

Descriptive Statistics	Statistic Score (*Posttest*)
Sample Size	30
Highest Score	85
Lowest Score	55
Average Score	76,2
Median	77,18
Modus	75,75
Standard Deviation	11,18

Mode Table 8 is the learning outcomes of students after the learning process using quizzes at the beginning of each lesson.

The highest score obtained by students is 85 and the lowest score is 55. With an average value of 76.2. Not only that, based on the table it can be seen that the median and mode of student learning outcomes are 77.18 and 75.75 with a standard deviation of 11.18.

a. Learning Readiness Results (Quiz Giving)
Based on the results of the data analysis it is known that students' quiz scores at each meeting have different values. The average score on the quizzes that students worked on was the lowest at the first meeting and the highest at the fourth meeting. Can be seen in Figure 1 below:
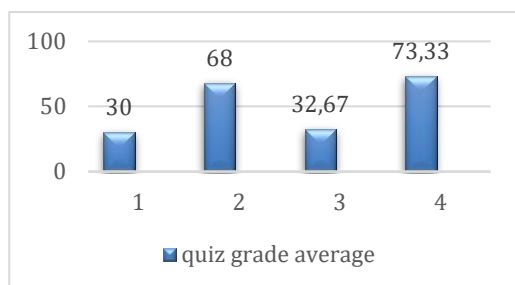
Figure 1. Diagram of Average Student Quiz Scores

Where in the first meeting the average score obtained by students was only 30 then there was an increase in the second meeting to 68. However, at the third meeting it again decreased where the average student quiz score was only 32 .67 and at the fourth meeting again experienced an increase with an average student score of 73.33.

b.   Student Learning Outcomes

The average value of student learning outcomes in the study is presented in Table 1. The average value of student learning outcomes is then grouped based on the standard of completeness of learning outcomes at SMA Negeri 3 Pangkep as shown in the table below:

Table 9. Percentage of Individual Completeness

Score	Criteria of Completeness	Frequency of Completed
$\geq 77\%$	Complete	12
$\leq 77\%$	Not complete	18
Total		30

Total Based on Table 9 it can be seen that the number of students who achieved completeness was 12 people. While the frequency of students who did not achieve completeness was 18 people. This shows that students in classes taught by giving quizzes assisted by quizizz media have low learning outcomes. In addition to individual completeness, student learning outcomes can also be reviewed from class completeness. The percentage of class completeness can be seen in Table 10:

Table 10. Percentage of Completeness Class

Score	Category	Frequency	Percentage (%)
$\geq 80\%$	Complete	12	40
$\leq 80\%$	Not complete	18	60
Total		30	100

Based on these data it can be seen that the mastery of the class in the class being taught has a smaller percentage completeness of than the percentage of incompleteness. Where the percentage of class completeness is 40% and the percentage of class incompleteness is ness 60%. The learning outcomes of these students are also reviewed based on the completeness of the indicators during the learning process. Table 11 below shows that the average percentage of completeness for each student indicator is 76.06%.

Table 11. Completeness of Student Learning Outcomes Indicators

No.	Indicators of Competence Achievement	Percentage Each Indikcator (%)	Description
1.	Explaining the meaning of buffer solution	90	Complete
2.	Analyzing the properties of buffer solutions and non-buffers	62,48	Not Completed
3.	Explaining the components of buffer solutions and their constituents	83,3	Complete
4.	Explaining the working principle of buffer solutions.	78,3	Not Completed
5.	Calculate the pH of an acid buffer solution from a mixture of a weak acid and its conjugate base and the pH of a basic	59,99	Not Completed

No.	Indicators of Competence Achievement	Percentage Each Indikcator (%)	Description
	buffer solution from a mixture of a weak base and its conjugate acid		
6.	Determine the mass and volume of making a buffer solution with a certain pH.	71,10	Not Completed
7.	Describe the buffer solutions in the human body	79,99	Complete
8.	Describe the function of buffer solutions in industry and medicine	83,33	Complete
	Average	76,06	

If the results are presented in the form of a diagram, the percentage of completeness indicators in learning is as shown in Figure 2. below this:
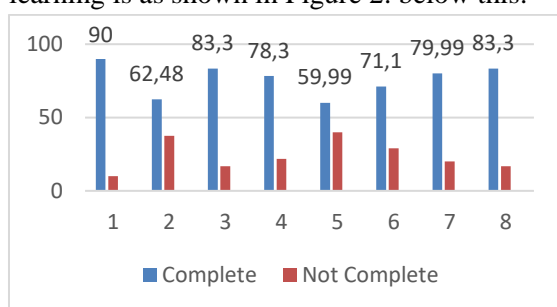

Figure 2. Percentage of Achievement Diagram for every Indicator

Based on the diagram, it can be seen that five indicators achieve completeness, and three indicators do not achieve completeness. Indicators that do not reach completeness are indicators analyzing the properties of buffer and non-buffer solutions, calculating the pH of an acid buffer

solution from a mixture of weak acids and their conjugate bases, and the pH of basic buffer solutions from a mixture of weak bases and their conjugate acids and determining the mass and volume in making a buffer solution with a pH certain. Based on the results of the analysis, a comparison of quiz results and student learning outcomes at each meeting can be seen in Figure 3.
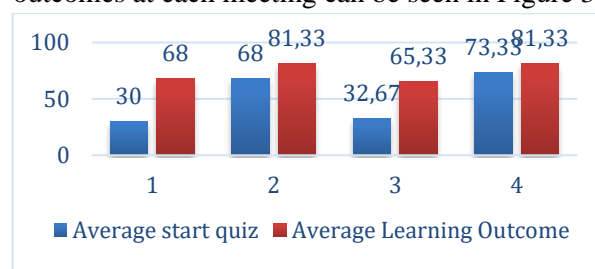

Figure 3. Diagram of Comparison of Quiz Scores and Learning Outcomes at Every Meeting

The data presented in Figure 3 is then processed to obtain an n-gain value. The results of data processing of normalized gain values of students at each meeting can be seen in Table 12.

Table 12. N-Gain Value of Learning Outcomes

Meeting	N-Gain Value
1	0,51
2	0,44
3	0,50
4	0,35
Average	0,45

c.   Analysis of Student Activity

Other data that can support student learning outcomes are student activity in class. Observation of student learning activities using two observers, then the assessment is averaged. Based on the results of observations made, the percentage of students' learning activities was obtained including the active category which can be seen in Table 13.

Table 13. Average Percentage of Student Activity

Activity	Percentage (%)	Category
Introduction	95,46	Very Good
Stimulation	85,82	Very Good
Identification of problem	85,8	Very Good
Data Collection	74,12	Good

Data Processing	80,8	Good
Verification	85,53	Very Good
Conclusion	84,97	Good
Closing	95,4	Very Good

d. Observation Results of Learning Implementation

Observations of learning implementation were processed to see how it was implemented during the learning process. This data is used as research-supporting data. Based on the results of observations by the two observers the percentage of learning implementation at each meeting is as follows:

Table 14. Percentage of Learning Implementation at Every Meeting

Meeting	Percentage (%)	Category
I	92,8	Good
II	100	Good
III	96	Good
IV	96	Good

2. Discussion

This study aims to determine the effectiveness of giving quizzes at the beginning of learning assisted by quizizz media in the discovery learning model on student learning outcomes in class XI IPA SMA Negeri 3 Pangkep on the subject matter of buffer solutions. This study used one class which was used as the research subject and the class taught was class XI IPA 2. This research was conducted in four meetings where each meeting was given a quiz at the beginning of the lesson using quizizz.

Quiz results at the beginning of learning show different results at each meeting. At the first meeting, it can be seen that the student's quiz scores were very low. There are no students who can achieve completeness. This happens because students do not know that a quiz will be held before learning begins. So that there is no readiness to learn from students, this is evidenced by the average quiz result of only 30. If the quiz scores at the beginning of learning are compared with the evaluation results at the end of learning, 13 students achieve completeness with an average of 80. Learning outcomes obtained by students are still low because only 43% of students can achieve completeness. This was also supported by the results of the percentage of completeness indicators where of the two indicators taught at this meeting there was only one indicator that achieved completeness. An indicator that did not reach completeness in the first meeting was to analyze the properties of the buffer and non-buffer solutions.

Based on the results of the analysis of students' answers, it can be seen that on this indicator students are still unable to determine the mixture that is a buffer and students are still lacking in determining the nature of the buffer. So that the percentage of completeness of this indicator is only 62.48%. Not only that, if you look at student worksheets on this indicator, students are still unable to analyze the nature of buffers. The low student learning outcomes are also caused because students do not yet have learning readiness and the students are less active in class. This can be seen from the percentage of student activity where only 18 students were active during processing and data collection.

Furthermore, at the second meeting, the quiz scores at the beginning of learning students increased compared to the previous meeting. At the second meeting, 14 students were able to achieve completeness in answering quiz questions at the beginning of learning. This happened because, at the previous meeting, students had been told what material would be taught at the next meeting. So that students can prepare themselves at home in advance to learn the material to be taught. After the learning process and evaluation were carried out at the end of learning at the second meeting 24 students achieved completeness with an average of 86.67. At this meeting, the percentage of student activity in the class was quite good because students had started to actively participate in the learning process. Good learning readiness and good student activity lead to increased student learning outcomes. It can be seen that there was an increase in learning outcomes compared to the previous meeting because the two indicators studied at this meeting reached completeness. The first indicator achieves completeness with a percentage of 83.3% and the second indicator achieves completeness with a percentage of 78.3%. Furthermore, at the third meeting, the quiz scores at the beginning of learning were low compared to the previous meeting. At the third meeting, there were no students who were able to achieve completeness in answering quiz questions at the

beginning of learning. This happens because at the meeting the material to be taught is material quite a difficult calculation. The characteristics of the material which are quite difficult make it difficult for students to answer quizzes even though they have studied it at home first.

After the learning process and evaluation at the end of learning at the third meeting, only 12 students achieved completeness in the material being taught with an average score of only 80. Based on the results of the analysis of student answers it can be concluded that on this indicator students are still unable to in calculating the pH of acid buffer solutions and the pH of basic buffer solutions and students are still unable to determine the mass and volume in making a buffer solution with a certain pH so that the two indicators at this meeting did not achieve completeness. During the learning process, it was seen that the results of the questions on the student worksheets (LKPD) were still not quite right. Based on the results of interviews with students, it can be seen that one of the factors that cause student learning outcomes to not be optimal is the time to work on the questions. Students feel that the time given is very short while the difficulty level of the questions is quite high.

Furthermore, at the fourth meeting, the quiz scores at the beginning of learning were the highest compared to the previous three meetings. At the fourth meeting, the students were getting used to the quiz system at the beginning of learning. This can be seen from the quiz scores obtained by students at the beginning of learning, 20 students were able to achieve completeness in answering quiz questions. This happened because the students had prepared themselves by studying at home before going to school so that when they were given a question there were already several students who could answer the question properly and correctly. Based on the analysis of the percentage of student activity in this meeting class, it has the highest percentage. Where quite a lot of students are actively involved during the learning process.

Not only was the percentage of student activity quite high, but student learning outcomes were also quite good compared to the previous three meetings. This is evidenced by the learning outcomes of students who are quite high. Where the learning outcomes of students at the fourth meeting 23 students achieved completeness with an average of 87.8. In addition, the two indicators at this meeting achieved completeness. Where in the first indicator the percentage of completeness

reached 79.99% and in the second indicator the completeness reached 83.33%.

Learning outcomes are of course not only influenced by the learning readiness of students but are also influenced by student activities in the classroom. Things that can support the improvement of student learning outcomes are student activities in the learning process. This can be seen based on Table 13 which shows that learning using the discovery learning model has a very good percentage of student activity, namely with a percentage of 85.98%. Student activities are assessed from preliminary activities to entering the learning syntax which involves five phases and closing activities.

In phase 1 of stimulation, students are in the very active category by paying attention to the pictures and explanations contained in the student worksheets (LKPD) with a percentage of 95.46%. In phase 2 of problem identification, in this phase students are in the very active category and 85.82% which can be seen when students pay attention to the stimulus that is on the student worksheets (LKPD) given. In addition, students are also able to ask questions related to learning objectives and can create a conducive atmosphere when conducting discussions. Phase 3 of data collection, in this phase, is only in the active 74.12% category. phase 4 of data processing, is in the good 80.8% category. If you look at the results of the analysis of student learning activities, student activity is in the very good category. However, when it is reviewed again, it can be seen that during the learning process in the classroom, especially when students collect and process data, there are still students who have not involved themselves in this syntax.

The lack of involvement of students in collecting and processing data in the discovery learning model will certainly affect the knowledge of students. This happens because in the discovery learning model students are required to be able to find and solve problems that exist in the formulation of the problem according to the learning objectives. So if students do not involve themselves actively in the two syntaxes, it can be concluded that students will not gain knowledge during the learning process. This is also one of the factors why students have low learning outcomes. Based on the results of the interviews, several students expressed the opinion that their learning outcomes were still quite low because some students were not used to using the discovery learning model, especially in discussions. So far,

students are only accustomed to using the lecture method so when the discussion method is applied, students are still not used to it.

In phase 5: proof, based on observations during learning it can be seen that when students prove the correctness of their work results with a group presenting the results of their work and other groups responding whether some errors or things need to be corrected. In the proving phase, the category of students listening to discussions and presentations from other groups is in the very good category but the percentage only reaches 85.53%. This can also be seen when discussing and when making presentations there are still students who do not listen to presentations from other groups and are not actively involved.

Another thing that supports learning outcomes is the implementation of each stage of the learning process. Based on the data in Table 14, it can be seen that at each learning meeting, it was carried out very well. So it can be concluded that the learning carried out is by the expected learning direction in the learning model of discovery learning. Implementation of very good learning will have a positive impact on learning outcomes. This is shown in Table 14 that the implementation of the learning process is included in the very good category in carrying out learning at each meeting.

Based on the results of the n-gain analysis, the meeting with the highest n-gain value was the first meeting of 0.51. This happened because, at the first meeting, there was an increase in learning outcomes compared to quiz scores. The quiz score with an average of only 30 increased to 68. So that this far-reaching increase gave a fairly high n- gain, while the lowest n-gain value was at the fourth meeting where the n-gain value was only 0.35. This happens because the increase in quiz scores to learning outcomes does not have a far nough range. After all, it is supported by good student learning readiness and more active student activities so that quiz scores are high enough when compared to learning outcomes at the meeting.

Likewise, at the second meeting, the n-gain value obtained was lower than in the first meeting. The n-gain value obtained is 0.44. This also proves that the value of the quiz to the learning outcomes of students does not have a large range. So that it can be concluded that the learning readiness and learning outcomes of students are good. Whereas at the third meeting when compared to the second meeting the n-gain value obtained was 0.50. Where the range of quiz scores and learning outcomes has increased quite high, this is because the material

that will be taught is quite difficult and the learning readiness of students at the meeting is lacking.

If the average n-gain value at each meeting is averaged, the final n-gain value is 0.45. Based on the categorization of the N-gain values contained in Table 3.5, the results of this study are effective and are in the medium category. Based on the results of the analysis and discussion above, this research is on the existing theory where according to Danial (2013) giving quizzes can improve student learning outcomes [10]. The advantage of giving quizzes is that it encourages students to be more serious in the learning process, and forms the habit of solving questions so that students achieve satisfactory learning outcomes. This is also in line with Parwita's statement (2014) which states that students who know they will be given quizzes can be more enthusiastic about learning, both inside and outside the classroom [11].

CONCLUSION

Based on the results of data analysis and discussion, it was concluded that giving quizzes at the beginning of learning assisted by quizizz media, the discovery learning model for class XI IPA students at SMA Negeri 3 Pangkep was effective. With an N-gain value of 0.45 in the medium category.

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