

## Analysis Of Final Semester Assessment Questions For Biology Subjects For The Even Semester Of The 2021/2022 Academic Year

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### ABSTRACT

This research is a quantitative descriptive study which aims to analyze the quality of Biology questions for class. The analysis was carried out through a multiple choice question document totaling 25 question numbers. Then, an analysis of the question items was carried out using the parameters of validity, reliability, level of difficulty of the questions, distinguishing power and effectiveness of distractors using existing formulas. The subjects in this research were students in class X Science at SMA Jaya Negara Makassar for the 2021/2022 academic year, totaling 20 students. The data collection technique was carried out by evaluation to obtain data in the form of exam questions, answer keys, and a list of student names. The data obtained was analyzed using the Anates Application Version 4.0.9. The results showed that (1) as many as 18 questions or 72% of the questions were declared valid, 2) the reliability of the questions was  $r_{11} = 0.36$  with high category (3) difficulty level of 48%, difficult questions and 20% easy questions. (4) The discriminating power of the questions is good, where  $> 5\%$  of the students have been selected (5) 56% of the questions have good and very good distractor effectiveness, and 16% have poor or poor distractor effectiveness.

Keywords: *Activating, speaking, interpreting graphs*

### INTRODUCTION

Learning assessment is part of the education system which takes the form of implementing curriculum programs (Hamalik, 2008). Evaluation is an assessment or determination of the value of something. Teachers have one role, one of which is as an evaluator who carries out evaluations with the aim of finding out the extent of students' success in learning (Elfira, et al., 2023). The success of the education system is largely determined by the learning process carried out by the teacher. Teachers play an important role in implementing evaluations and analyzing the results of evaluations. The results of the analysis of the evaluation will provide an overview of the strengths and weaknesses of the learning process and can be used as a consideration for teachers to improve the learning process in the future.

Quality questions are a parameter in determining learning outcomes. Question item analysis is a mandatory activity that teachers carry out to determine the level of student learning outcomes and to improve the quality of the questions that have been prepared. This activity is a process of collecting, summarizing, and using information from students' answers to make decisions in assessment (Syahputra, etc., 2020). Measuring tools in the form of learning outcomes tests must be able to measure the extent of students' understanding and mastery of a particular competency. Assessment is a vital component in learning activities (Bahar, et al., 2021).

Quantitative item analysis emphasizes the analysis of internal characteristics including the question parameters validity, reliability, level of difficulty, distinguishing power and effectiveness of distractors (Sukmela & Nofrion, 2018). Quality tests can be used repeatedly

with slight changes, while tests that are less quality should not be used to give grades to students. Poor question quality can result in an educator mistakenly identifying the ability level of individual students (Wand & Gerald, 1977). This is in line with research by Osna, et al., 2016 which revealed that teachers at each level usually use existing questions and then adapt them to the teaching material.

End of semester assessment is an example of a summative assessment which aims to evaluate student learning at the end of a learning unit by comparing it against several standards or benchmarks (Murchan & Shiel, 2017). Biology learning results in the Even Semester Assessment at Jaya Negara High School in the 2020/2021 Academic Year are still low, with the average score being 50 with a learning completion percentage of 27.5%. This achievement is still below the Minimum Completion Criteria (KKM). This is reinforced by the results of interviews with Biology subject teachers and students who obtained information that the questions that teachers often use in end-of-semester exams are questions that are prepared by the subject teacher themselves and have been analyzed previously. As many as 40% of students said the biology questions they were working on were too difficult.

## **METHODS**

The research was carried out at SMA Jaya Negara in the Even Semester, 2021/2022 academic year. The type of research used in this research is quantitative descriptive research through multiple choice question documents totaling 25 question numbers. Next, an analysis of the question items was carried out using the parameters of validity, reliability, level of difficulty of the questions, distinguishing power and effectiveness of distractors using existing formulas. The subjects in this research were students in class X Science at SMA Jaya Negara Makassar for the 2021/2022 academic year, totaling 20 students. The data collection technique is carried out by evaluation to obtain data in the form of exam questions, answer keys, and a list of student names. The data obtained is analyzed using the application *Ducks* Version 4.0.9. The results of the analysis will be presented in the form of figures accompanied by explanations. According to Sugiyono (2013), quantitative descriptive research is research carried out by collecting, presenting and analyzing data in the form of numbers and then interpreting it. Quantitative descriptive research uses statistical analysis tools whose results are then displayed in the form of graphs, diagrams or in table form (Tohardi, 2019).

## **RESULTS AND DISCUSSION**

Analysis of final even semester exam questions for class X biology at SMA Jaya Negara, which is one of the new schools in Makassar district. The questions used are multiple choice questions (*multiple choice*) totaling 25 numbers, the analysis of question items was carried out qualitatively, covering aspects and constructs, while quantitative analysis included measuring the reliability of the question items, differentiating power, level of difficulty and effectiveness of distractors or distractors.

The data obtained were analyzed using the ANATES program version 4.09. Based on the results of the analysis of the 25 multiple choice questions, it was stated that the 25 questions were distributed based on their validity index, which can be seen in Table 1.

Table 1. Distribution Of Validity Of Biology Test Items

No	Validity index	Question Item Number	Amount	Percentage (%)
1	If the index value is above or equal to 0.361, then the question is declared valid	1,2,3,4,5,8,9,12, 13,14,15,16, 18, 20,22.23,24,25	18	72
2	If the index value is less than 0.361 then the question is declared invalid	6,7,10,11,17,19 21	7	28

Based on Table 1a. It is known that of the 25 multiple choice questions, 7 questions were declared valid and 18 questions were declared invalid. The results of the analysis of invalid questions show that there are questions with unclear instructions. Apart from that, the choice of words used has a high level of difficulty.

Question quality parameters are reviewed from the reliability aspect. The results of the analysis of questions using the KR 21 formula show that the reliability of multiple choice questions is 0.36, with a low interpretation as shown in Table 2.

Table 2. Results of analysis of the level of reliability of Biology questions

Reliability analysis	Reliability value ( $r_{11}$ )	Category
	0,36	Height

Based on the data from the reliability analysis in table 4.2, it is known that the level of reliability of the questions (UAS) for even class X biology subjects at SMA Jaya Negara Makassar is classified as reliable, with a value of  $r_{11} = 79$  which are in the high category ( $r_{11} > 70$ ). The higher the reliability value indicates that the questions have good reliability, referring to the consistency and consistency of the measurement results, meaning that no matter how many times the test is used, it will still produce relatively the same value.

The question quality parameters are then reviewed from the level of difficulty aspect. The results of the distribution of difficulty levels analyzed using the Anates 4.0.9 application with a difficulty index between 0.00 and 1.00, can be seen in Table 3.

Table 3. Distribution of Difficulty Levels of Biology Question Items

No	Category	Mount	Question number	Percentage (%)
1	Very easy	2	1,6	8
2	Easy	3	2,24,25	12

3	Medium	8	34,5,8,10,11,13,18,21	32
4	Difficult	7	3,9,12,15,16,17,19	28
5	Very difficult	5	7,14,20,22,23	20

Table 3, the proportion of questions in each category is good, but there are more difficult and very difficult questions with a percentage of 48%, compared to easy and very easy questions with a percentage of 20%. A good question is a question that is neither too easy nor too difficult. Questions that are too easy do not stimulate students to increase their efforts to solve them (Arikunto, 2016). Therefore, the End of Semester Assessment questions in Biology are quite difficult questions.

The fourth question quality parameter is analysis of the differentiating power of the questions using the Anates 4.0.9 application. The results of the distribution of the differentiating power of the questions are shown in Table 4.

Table 4. Distribution of Discriminating Power of Biology Question Items

No	Category	Amount	Question number	Percentage (%)
1	Negative	1	7	4
2	Signs	12	3,6,9,10,11,13,14,19,20,22,23,25	48
3	Just	6	2,4,15,16,17,21	24
4	Good	5	1,5,12,18,24	20
5	Very good	1	8	4

Table 4. shows that of the 25 multiple choice questions that have been analyzed, 1 question item is in the negative category, 12 questions are in the bad category, 6 questions are in the quite good category, 5 questions are in the good category, and only 1 question is in the good category. very good category. Thus, semester assessment questions in biology subjects are less able to differentiate students who are smart (high ability) from students who are less intelligent (low ability).

The fifth question quality parameter is the effectiveness of distractors. The effectiveness of distractors is carried out by counting students who choose each alternative answer for each item. The criteria for a good distractor is if the distractor is chosen by at least 5% of the test participants. Data from the analysis of the effectiveness of distractors can be seen in Table 5.

Table 5. Effectiveness of Distractors on Biology Questions

No	Effectiveness distractor	Question number	Amount	Percentage (%)
1	Very good	5,6,11,12,15,16,17, 18	8	32
2	Good	4,8,10,14,20,23	6	24
3	Enough	2,3,7,9,13,19,21,	7	28
4	Not good enough	22	1	4
5	Not good	1,24,25	3	12

Based on Table 5. showed that of the 25 multiple choice questions, 8 questions had very good distractor effectiveness, 6 questions were good, 7 questions were sufficient, 1 question was poor, and 3 questions were not good. Based on the analysis of students' answer options, it is greater than 5%, so giving distractors is quite effective.

Based on the results of the analysis, it can be determined which questions are of good quality (accepted), of poor quality (revised), and of no quality (rejected). Analysis for multiple choice questions which are included in the quality criteria, the items which are included in these criteria are questions number 2, 9, 12, 14, 16 questions that have criteria for low quality, questions that include these criteria are questions number 10, 11, 15, 20, 23 and 25 questions that have criteria for not being qualified, questions that include these criteria are questions number 1, 3, 4, 5, 6, 7, 8, 13, 17, 18, 19, 21, 22 and 24.

## CONCLUSION

Analysis of Biology questions in the even semester assessment for the 2021/2022 academic year based on the parameters of validity, reliability, level of difficulty, distinguishing power and effectiveness of distractors shows good quality. 1) 18 questions or 72% of the questions were declared valid, 2) question reliability  $r_{11} = 0.36$  in the high category (3) the difficulty level was 48%, the questions were difficult and 20% of the questions were easy. (4) The discriminating power of the questions is good, where  $> 5\%$  of the students have been selected (5) 56% of the questions have good and very good distractor effectiveness, and 16% have poor or poor distractor effectiveness.

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