JIPS 6 (3) (2025)
Jurnal Inovasi Pendidikan dan Sains
E-ISSN 2721-9119
https://ejournal.unwmataram.id/JIPS

Analysis of Tendencies for Guessing Answers in Physics Objective Test

Risnawati Uding[1]*, Hartono[2], Ellianawati[3]

[1,2,3]Physics Education Study Program, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang, Indonesia

---
Corresponding Author:
Author Name*: Risnawati Uding
Email*: risnauding@gmail.com

Accepted: May 26th 2025. Approved: October 12th 2025. Published: October 19th 2025

ABSTRACT

This study aims to analyze students' tendency to guess answers on physics objective tests and how to guess based on gender, ability grouping, and grade level. The population of this study is all students of State Senior High School 31 Maluku and State Islamic Senior High School 4 Maluku. Quantitative data analysis in the form of physics semester test results was collected and analyzed with the Rasch Model using the Winstep Application, while qualitative data analysis was in the form of questionnaires and interviews. Students identified as guessing using RaschModel were 27 students, and 72 students were identified through interviews. The results of women's guesses were 68% correct, compared to men, who were only 32%. Students in high-ability groupings had a percentage of 77% correct guesses and 94% incorrect guesses from medium- and low-ability groupings. The way to guess students in high-ability groupings is by choosing the option with the smallest number, seeing the same numbers between the question and answer choices, and using mathematical operations.

Keywords: analysis, tests, physics

INTRODUCTION

The administration of semester exams is one form of assessment that determines the achievement of competence in a subject. The most widely used test form during semester exams is an objective test presented in the form of multiple-choice questions. Teachers are more interested in using multiple-choice objective tests to measure student abilities[1].

Test takers think it will be easier to do a multiple-choice test than a description test. In difficult conditions, such as test takers not knowing for sure the answer they will give, multiple-choice tests provide opportunities to speculate or guess the answer with several answer options provided. This tendency to guess answers occurs a lot in the administration of objective tests in the form of multiple-choice. Multiple-choice tests have several potential limitations, including guessing[2].

Test takers will guess the most likely answer when they are unsure of the consequences of their guessing. According to [3], Guessing means giving an explanation or making a judgment about something without ensuring all the facts. Furthermore, Lee[4]has argued that the tendency to guess answers is one of the most common things that occurs as an effort for learners to maximize test scores. For students whose abilities are close to the passing level, success or failure may depend on their guesses[5].

The possibility of students successfully working on problems depends on the ability of the students themselves and the level of difficulty of the items they work on [6].

The ability that is very necessary, especially in solving physics problems, is the ability to solve problems. Ramadani [7] has argued that there are differences in skills for problems between men and women. Men are good at logical thinking, while women are good at remembering.

Hartanti [8]has argued that female students look more concerned and serious when working on test questions, females more questions when they find unclear test questions, while male students tend to play in class and answer questions that are not related to the test questions, test takers make guesses because the test questions are not by their abilities, meaning that the questions are too difficulty to solve for their ability level. The low ability of students provides an opportunity to guess because the chance to know how to answer the question correctly depends on the ratio between the ability of the students and the difficulty level of the question [9].

The stages students in working on problems include thinking processes from basic levels to more complex levels. At the high school level, the grade level is divided into 3 is: class X, class XI, and class XII. Each level has different characteristics. Each grade level has differences in the distribution of learning styles that affect the way students think, emotionally, and problem-solving [10].

Information from physics subject teachers is that there are students who answer correctly on difficult category questions, but tend to answer incorrectly on questions that are categorized as easy, so this shows the

tendency of students to guess. Test takers whose abilities are classified as high have a greater probability of answering correctly than test takers with low ability [11].

The tendency to guess answers when taking tests is a source of measurement error in tests, including semester tests to be classified as achievement tests. This will certainly make it difficult for teachers as assessors to distinguish scores obtained by students purely and by students who make guesses. In turn, pass-fail decisions are also influenced by guessing[12].

Based on this statement, it can be concluded that the tendency to guess answers often occurs and is something that needs to be analyzed further. Many studies have examined the tendency to guess answers, but there are still few that analyze the tendency to guess answers on physics objective tests based on gender, ability grouping, and grade level simultaneously.

RESEARCH METHOD

The method used in this research is mixed methods. The population in this study be students from SMAN 30 Central Maluku and MAN 4 Central Maluku in the even semester of the 2023/2024 school year, as 251 people. The samples to be taken in this study were students of Class X, XI, and XII MIA at MAN 4 Central Maluku and SMAN 30 Central Maluku be calculated using the Slovin formula according to [13]. Slovin's formula for determining the sample;

$$n = \frac{N}{1+N(e)^2}.$$

The research design used is a sequential explanatory design. Researchers chose this research design because the processing of collecting quantitative and qualitative data was carried out in two different stages. The research design chart is Figure 1.

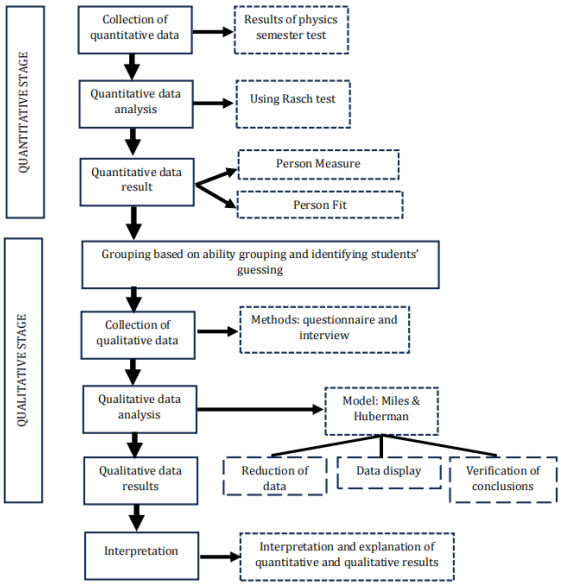


Figure 1.*Sequential Explanatory Research Design*

1. **Quantitative Data Analysis**

   Quantitative data on the tendency to guess answers on physics objective tests were analyzed based on semester test results using the Rasch Model with the help of the Winstep and Questionnaire applications. The test results aim to group based on ability grouping, and students are identified as guessing. Ability analysis groups students based on their ability level, and students have different response patterns (one of which is a guess). This grouping is based on test results from three classes, namely Class X, Class XI, and Class XII, from 2 high schools with different questions.

2. **Qualitative Data Analysis**

   Qualitative data is obtained from the results of distributing questionnaires and interviews to students to analyze the tendency of students to guess answers by describing the mindset of students in making guesses.

   The questionnaire sheet was given to students after the objective test was conducted through Google Forms. The questionnaire method is needed to determine the responses to questions and what factors influence students' guesses of answers. The questionnaire used was developed from a questionnaire for solving physics problems[14]. The type of questionnaire used in this study is a closed questionnaire (there are alternative answer choices). There are 23 statements containing 12 indicators related to physics problem solving and the tendency to guess answers in the questionnaire. The questionnaire was analyzed using a descriptive qualitative method using the percentage formula in equation [15].

$$p = \frac{f}{n} \times 100$$

Description:

p : percentage (%)
f : frequency of each questionnaire answer
n : number of respondents

After being percented, the data obtained istabulated into the criteria used to summarize the data based on Table 1. [15].

Table 1. Criteria for the Tendency to Guess Answers

Persentase (%)	Category of tendency guessing the answer
0 - 20	Very Low
21 - 40	Low
41 - 60	Fair
61 - 80	High
81 - 100	Very High

The results of **quantitative** data analysis related to students are identified as guessing in grouping with the questionnaire results, according to Table 2.

Table 2. The results of the analysis of the tendency to guess answers based on Rasch test and Questionnaire

Rasch Test	Questionnaire
Guessing	Not guessing
Not guessing	Guessing
Guessing	Guessing

Students will be further interviewed based on grade level, ability grouping, and gender to further analyze the tendency to guess answers. The next stage is the data analysis stage using the Miles and Huberman model, which includes three interactive steps: data reduction, involving the process of selecting, simplifying, and focusing on relevant interview information; data display, which organizes the reduced data into tables and matrices to facilitate understanding of patterns and themes; and conclusion verification, where the findings are interpreted, cross-checked, and validated to ensure their accuracy and consistency [16].

This study found that students tend to guess answers on objective physics tests. The tendency to guess was identified through an analysis of semester test results using the Rasch Model. From 251 students who took the test, 27 were identified as guessing based on Rasch analysis, while interviews with 72 students confirmed the same behavior. Students admitted to guessing on 5 to 20 out of a total of 25 to 30 questions. The main reasons for guessing were question difficulty, forgetting how to solve a problem, confusion due to similar answer options, and insufficient time.

Furthermore, although some students forgot the material, many mentioned during interviews that they remembered the final answer from problems solved in class. This suggests that students tend to memorize final answers rather than understanding the underlying concepts and problem-solving processes. This finding is consistent with recent studies [17] that suggest students often memorize formulas before attempting to understand the concepts.

The Rasch analysis identified 27 students with an “unnatural” or misfit response pattern. This pattern occurs when students with low ability correctly answer difficult questions but fail to answer easy ones. Students should ideally answer questions in line with their ability level; a correct answer to a difficult item should imply they can also answer easier ones. The inconsistency in their responses suggests that their correct answers to difficult questions are likely the result of random guessing or a "lucky guess" [18]. This conclusion is supported by interview data, where students admitted to guessing the correct option because it had not been selected in a previous question. Other reasons for guessing included the questions being difficult, rarely studied at home, and time constraints. This confirms that students struggle with physics, particularly with formulas and numerical applications.

RESULTS AND DISCUSSION

Physics test results were analyzed using the Rasch Model, producing ability grouping data as presented in Table 3.

Table 3. Sample proportion by Ability Grouping

Ability Grouping	Total	Percentage (%)	Sample Proportion
High	67	27	6
Medium	71	29	7
Low	113	45	10
Total	251	100	23

Based on Table 3, a total of 23 students were sampled proportionally from each ability group (high, medium, and low) for further interview analysis. The Rasch analysis further classified students’ ability levels according to *person measures*, which were then distributed by class level as shown in Table 4.

Table 5 shows that Grade XI has the highest proportion of low-ability students (56%), while Grade XII has the highest proportion of high-ability students (43%). These distributions form the basis for the

following analysis of students' guessing behaviors according to their ability groups.

Table 4. *Ability Grouping*

Class	*Ability Grouping(%)*			Number of Student
	High	Medium	Low	
X	31	23	46	85
XI	8	36	56	87
XII	43	25	32	79
Total	67	71	113	251

1. High-Ability Grouping

Students in this group used more strategic guessing methods to maximize their chances. Their strategies included: Guessing by choosing the option with the smallest number and there are even numbers; Guessing by looking at the same numbers between the question and answer choices; Guessing by using mathematical operations of multiplication, addition, subtraction, and division if they do not remember the formula.

These strategies demonstrate a logical approach to guessing, where students use their partial knowledge to eliminate improbable options, which is consistent with research on strategic guessing [19]. The high-ability group showed a 77% success rate for correct guesses, highlighting their use of logical reasoning to improve their odds [20].

Students in this group employed more strategic and logical guessing methods to maximize their chances. Their common strategies included: Selecting the smallest or even-numbered options; Matching numbers appearing in both the question and answer options; and Using mathematical operations (multiplication, addition, subtraction, division) when they forgot the formula.

These strategies demonstrate partial conceptual reasoning rather than random guessing, which aligns with previous studies on strategic guessing [19]. The high-ability group achieved a 77% success rate in correct guesses, indicating effective logical reasoning and higher test awareness [20].

2. Medium-Ability Group

Medium-ability students displayed moderately logical guessing patterns, such as: Choosing options with similar numerical elements to their rough calculations; Eliminating distinctly different options before choosing the most similar one; and Preferring smaller-numbered options.

This elimination-based approach suggests that distractors strongly influence guessing behavior [21]. Their preference for middle-positioned answers (B, C, or D) supports [22], indicating that test constructors often place correct keys in central positions. However, this tendency can weaken item discrimination and reliability, evidenced by the relatively low reliability coefficients of 0.76 and 0.73 obtained in this study [23].

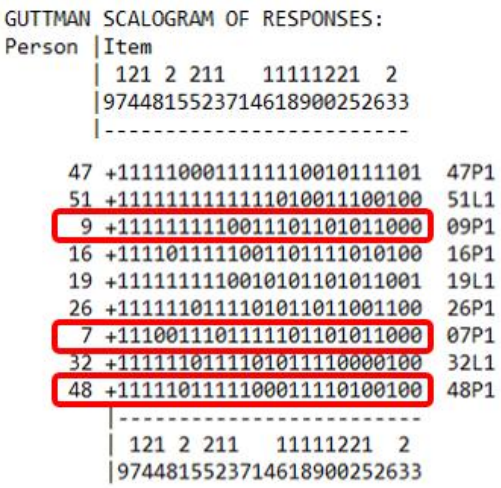
3. Low-Ability Group

Low-ability students demonstrated the most diverse yet least strategic guessing behaviors, including: Counting buttons or using "neat" numbers; Choosing even numbers or alphabetically ordered answers (A–B–C); Associating numbers with names or letters; and Selecting answers arbitrarily.

These behaviors indicate limited conceptual understanding and reliance on random guessing [24,25]. The large number of low-ability students engaging in such guessing confirms findings that lower proficiency often increases guessing tendencies [26].

Irregular response patterns inconsistent with students' ability levels indicated potential guessing or random responding. This was examined using the Guttman matrix and Scalogram results presented in Table 5.

Table 5. *Scalogram*



Analysis identified Persons 47P1, 19L1, and 07P1 as likely guessers based on person misfit indicators: Person 47P1 guessed on items 3, 6, 2, 15, 20, 18; Person 19L1 guessed on items 3, 2, 15, 20; and Person 07P1

guessed on items 2, 15, 20, 19. Item difficulty ordering revealed that these low-ability students answered difficult items correctly (e.g., items 3, 6, 2, 15) but missed easier ones (items 14, 8, 5). Such non-fitting response patterns indicate guessing tendencies. The summary of this detection is visualized through Rasch analysis output in Figure 2.

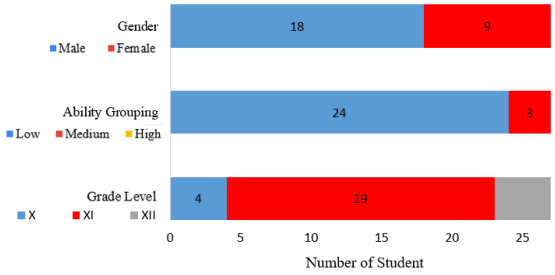


Figure 2. Rasch analysis results of students identified as guessing

Figure 2, shows the distribution of learners identified as guessing based on the Rasch analysis results. Based on gender, 18 male students and 9 female students were identified as guessing. Based on Ability Grouping, as many as 24 low-ability students, and 3 medium-ability students, but no high-ability students were identified as guessing. Furthermore, the results of the analysis of the 3 grade levels found that 4 students from class X, 19 from class XI, and 4 from class XII were identified as guessing.

Based on the analysis by grade level (X, XI, and XII), students from grades XI and XII generally shared similar guessing reasons. However, Grade X students were more likely to resort to immediate guessing or ask friends when they had limited knowledge of a topic. An interview with a Grade X student (29L4) confirmed this: "I have learned from home but forgot. Then I added up the numbers in the problem 40+80+20=140" question number (the guess is correct)." This shows their tendency to use basic math operations as a fallback. This is consistent with a diverger learning style, which is common in this age group [27,28].

The highest number of students identified as guessing was from Grade XI (19 people). Furthermore, students from lower grades (X and XI) showed a significantly higher guessing tendency (83%) compared to Grade XII (27%). The primary difficulty identified in interviews was understanding temperature and heat concepts, specifically the process of substituting numbers into equations, which corroborates findings by Azizah [29].

Based on Rasch analysis, 18 male and 9 female students were identified as guessers. Male students cited reasons such as not knowing how to solve the problem, not understanding the material, running out of time, and general question difficulty, with their guesses ranging from 4 to 20 questions. Female students, on the other-hand, reasoned they did not find the answer they were looking for, faced difficult questions or similar answer choices, forgot formulas, and felt the questions were harder than those taught in class. Their guesses ranged from 2 to 24 questions. This shows that time pressure is a major factor for both genders.

Interestingly, female students were more successful at guessing correctly than male students. Of the 16 students who guessed correctly, 11 were female and only 5 were male. This could be due to differences in their guessing strategies. Both genders struggle with formula-based problems. However, females tend to use elimination techniques or choose options with similar values to their partial calculations, often relying on instinct or "gut feeling." This aligns with findings that women often perform better on tasks requiring them to explain scientific phenomena and use evidence.

In contrast, males often attempt a calculation first and then make a random guess if the answer isn't a close match. They may also skip questions and return to them later. This tendency for logical, problem-solving-based guessing in males is supported by literature [30]. An interview with a male student (21L5) illustrates this: "I calculate, if the result is close, then I match it with the option. If not, I skip the question until the time is almost up, I will immediately choose an option randomly." In situations of complete uncertainty, both genders admitted to blind guessing randomly choosing an option without any reasoning especially when time was running out. This panic-driven behavior is a common response to time pressure in exams. A snippet of personal interview 18P4: "I guessed because time was running out, and immediately chose a random answer because I saw other friends already collecting their test result".

The results of the questionnaire analysis used a Likert scale with four scales, namely Strongly Agree (SS), Agree (S), Disagree (TS), and Strongly Disagree (STS). The initial data from the questionnaire results are presented in Microsoft Excel and then analyzed using the SPSS application. The following analysis results using SPSS are presented in Table 6.

Table 6. Results of Questionnaire Analysis

Indicator	Percentage (%)
Problem-solving strategies by students	58
The role of mathematics and formulas in solving problems	44
Discussing and asking questions in solving problems	61

Indicator	Percentage (%)
Considering the use of appropriate problem-solving procedures	67
The role of concepts in solving physics problems	73
Rechecking answers	66
Not giving up easily when facing difficulties	36
Interest and comfort in solving problems	46
Having many alternatives for solving physics problems	71
The ability to solve various types of physics problems forms	58
Confidence in solving physics problems	39
Guessing answers	50
Problem-solving strategies by students	62
The role of mathematics and formulas in solving problems	57

The factors that cause students to guess the answer are as many as 62% who agree that they will guess the answer if the question is difficult to do, know a little how to solve it, don't know at all how to solve it, are not sure of the answer, there is no penalty (score calculation) if the guess is wrong, the answer choices are almost the same, and even though the time for working on the problem is still long or almost up, students will guess the answer to the remaining questions.

To find out the purpose of students working on questions, 57% of students agreed with the statement "The purpose of doing test questions is not only to pass the subject but to find out competencies that have not been understood and the rest strongly agreed. To further understand students' reasoning behind their guessing behavior, qualitative interviews were conducted following the test and questionnaire analysis

Qualitative data analysis is described based on the results of the interviews conducted after analyzing students' physics test results. Interviews were conducted with students at each grade level and based on ability grouping to find out information on how students guessed the answers to each criterion.

The results from the interview were obtained from the data of students who were identified as guessing, which can be seen in Figure 3.

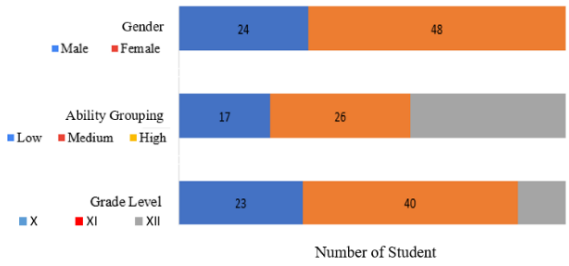


Figure 3. Interview data of students are identified as guessing

Figure 3 shows the distribution of students identified as guessing, categorized by gender, ability grouping, and grade level. A total of 72 students consisted of 3 grade levels, namely class X 23 people, class XI 40 people, and class XII amounted to 9 people. Meanwhile, for the distribution of ability levels, 17 students with high ability, 26 with medium ability, and 29 with low ability which obtained.

The number of males identified as guessing based on the results of the interviews was 24, and 48 female students. The results of the interviews showed that the distribution of ability grouping of students is identified as guessing at the three grade levels in Table 7.

Table 7. Distribution of Ability Grouping of Students Identified as Guessing by Grade Level

Class	*Ability Grouping*			Number of Student
	High	Mediun	Low	
X	6	8	9	23
XI	6	15	19	40
XII	5	2	2	9
Total	17	25	30	72

Based on the distribution of ability grouping at the grade level above, the number of students with low ability in classes X and XI is more than the students with high ability, while in class XII, the students with high ability. Students who guessed answers were further categorized based on whether their guesses were correct or incorrect, as shown in Figure 4 illustrates the proportion of students who made correct and incorrect guesses based on the analysis results, where 78% of guesses were incorrect and 22% were correct.

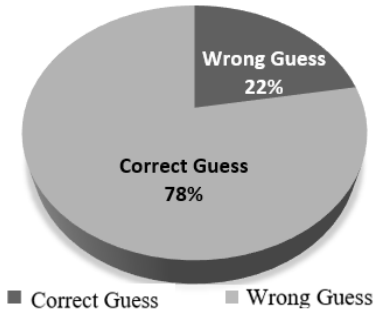


Figure 4. Visualization of the percentage of students who guessed correctly and incorrectly based on interview data

The interviews revealed several distinct guessing strategies used by students, summarized in the following data display. Table 8 presents the interview findings for the high-ability group. Table 8 provides information about the data display of interviews in the high group. As shown in Table 7, low-ability students in Grades X and XI outnumber those in the high-ability group, whereas Grade XII shows a higher proportion of high-ability students.

Table 8. Display data from the high group interviews

Key Themes	Findings Description
Experience and reasons for guessing	Guessing because of difficult questions, running out of time, having forgotten the material, trying but not getting the final result,
	Guessing because of difficulty understanding questions that do not have pictures (vector material).
	Guessing 4 to 12 numbers
Linkage of concept knowledge and tendency to guess	Guessing due to a lack of understanding of the physics material that has formulas.
	Guessing due to forgetting the basic material that had been taught in the past.
	Guessing by choosing the option with the smallest number, an even number.
Ways of thinking in making guesses	Guessing by using mathematical operations of multiplication, addition, subtraction, and division when forgetful the formula.
	Guessing by looking at the same numbers between the question and answer choices.

Table 9. Display data from the medium group interviews

Key Themes	Findings Description
Experience and reasons for guessing	Guessing because of difficult questions, not understanding the material, forgetting the formula, forgetting how to work, running out of time,
	Guessing 5 to 10 numbers
Linkage of concept knowledge and the tendency to guess	Guessing because they forgot the concept of materials, especially the use of the right formula.
	Guessing due to difficulty understanding the material, Static electricity, and electromagnetic induction
Ways of thinking in making guesses	Guessing by choosing options that have the same numerical elements as the results obtained
	Guessing by eliminating different options, then choosing one option that looks the same.
	Guessing by choosing the smallest number
	Using the results of mathematical operations of multiplication, addition, subtraction, and division.

Tabel 10. Display data from the low group interviews

Key Themes	Findings Description
Experience and reasons for guessing	Guessing answers because of not studying, difficult problems, not knowing how to work, forgetting how to work, times running out, and almost the same answer choices.
Linkage of concept knowledge and the tendency to guess	Guessing about 3-24 questions out of a total of 20-20 questions done.
	Guessing on problems whose solutions use formulas.
	Guessing due to difficulty understanding the material on temperature and heat (formula), and global warming.

Key Themes	Findings Description
Ways of thinking in making guesses	Guessing by counting buttons, using instinct, and feeling.
	Choosing a neat arrangement of numbers and even numbers.
	Choosing options in alphabetical order of letters A, B, C, and options that have consecutive numbers 1, 2, and 3.
	Using mathematical operations of multiplication, addition, subtraction, and finally division.
	Choosing an option that has not been chosen in the previous problem.
	Associating numbers, letters, and names to select answer options.
	Seeing the same numbers in the question and the answer choices
	Guessing by selecting the numbers of your liking

The results of the interviews were analyzed according to students' ability groupings high, medium, and low. Each group demonstrated distinct characteristics in terms of their reasons for guessing, the linkage between conceptual mastery and guessing behavior, and their ways of thinking when making guesses.

Based on Table 8, students in the high-ability group generally guessed after trying to solve the problems logically. Their reasons for guessing were related to time constraints, forgotten formulas, or difficulties in interpreting questions without visual aids, such as vector problems. They tended to limit the number of guessed items to about 4–12 questions and used more systematic approaches such as identifying patterns, performing mathematical operations like multiplication, addition, subtraction, and division, or choosing the smallest or even-numbered options. This group showed a higher level of reasoning and strategic thinking in their guessing behavior, indicating a form of intelligent guessing rather than random guessing.

Based on Table 9, students in the medium-ability group showed less structured strategies. Most of them guessed due to difficulties in understanding the material, forgetting formulas, or running out of time. The number of guessed questions ranged from 5 to 10 items. Their guessing patterns included choosing options with numerical elements similar to their calculations, eliminating dissimilar alternatives, or selecting the smallest number. Although some logical reasoning was still visible, their decision-making was less certain compared to the high-ability group, showing a transitional pattern between reasoning-based and random guessing.

Based on Table 10, the low-ability group demonstrated the highest frequency and randomness in guessing behavior, with 3 to 24 questions guessed. Their reasons for guessing included not studying, forgetting the working process, or feeling confused by similar answer choices. Their guessing strategies were mostly intuitive, such as counting buttons, using instinct or feelings, or choosing aesthetically neat or even-numbered answers. Some students relied on patterns like alphabetical order (A, B, C), consecutive numbers (1, 2, 3), or selecting options that had not been chosen previously. These behaviors reflected a lack of conceptual understanding and a tendency to rely on random guessing without analytical consideration.

The variations in guessing strategies across ability levels suggest that students' cognitive abilities influence how they make decisions under uncertainty. High-ability students tend to use reasoning-based strategies, while medium- and low-ability students rely more on instinctive or pattern-based methods. This highlights the importance of developing conceptual understanding and metacognitive awareness to reduce the tendency to guess randomly and to promote more meaningful engagement with problem-solving tasks.

Guo [30] has argued that confidence-based assessment allows teachers to distinguish between reasonable guesses and random guesses, thus providing more accurate information about students' level of knowledge. (c) Students can use elimination techniques by eliminating wrong answers based on contextual clues.

Teachers can train students to manage uncertainty during exams, one of which is teaching students elimination techniques, (d) manage anxiety during exams so that students do not panic or tense when dealing with questions, and (e) students can manage time, thereby reducing the opportunity to guess randomly without any consideration

Based on the results of interviews with physics subject teachers, it is known that all of them admit to having analyzed the tendency to guess their students, but the analysis is still manual by comparing the affective, cognitive, and psychomotor abilities of students in the classroom with the results of students' achievements through tests. The physics teacher said that if the results of the analysis found students who guessed the answer, it would be followed up by not using the raw score of the results because students who did the test questions seriously without guessing would get a score that was not by their abilities and was considered unfair.

The steps taken are to approach by digging up further information related to students who make guesses by calling and asking about the process of working on the test questions, If it is proven to be guessed, then the score obtained previously will be recalculated. Because in turn, the pass-fail decision is also influenced by guessing.

Based on the description above, the tendency to guess answers makes it very difficult for teachers as assessors to obtain student achievement scores according to the needs and competencies of the students

themselves. If this is ignored, it will provide losses for students who do not guess and invalidate the results of measuring student abilities at each stage of their development. The findings of how to guess correctly made by the high group obtained the highest percentage of 70% so that it is taken into consideration if when medium and low ability students have the opportunity to guess, the method or strategy of high ability students can be used as a reference in improving their ability to solve test questions.

CONCLUSION

Students tend to guess answers on physics objective tests with the number of students identified as guessing using Rasch analysis, namely 27 people and 72 others identified through interviews, because the questions are difficult, do not understand the material, especially those related to formulas, have almost the same answer choices, and limited time.

The number of men identified as guessing was more than women. Women use the elimination technique and choose options that are almost the same or close in value to the calculation results and prefer to guess using instinct, while men calculate first using mathematical operations, then immediately guess and use the button counting method.

ACKNOWLEDGMENTS

The author would like to thank Semarang State University, MAN 4 Central Maluku, and SMAN 31 Central Maluku for providing opportunities and facilities to conduct this research.The author would like to thank the supervisors who have given valuable direction and guidance during the research process. Finally, the author would like to thank all those who have helped directly or indirectly in the completion of this research.

REFERENCES

[1] R. Agustin, A. N. Khasanah, D. Surani, K. Septina, D. Nafizah, and R. I. M. Fajrin, "Penggunaan tes pilihan ganda sebagai alat evaluasi di sekolah menengah pertama negeri 2 kedawung sragen," vol. 1, no. 4, pp. 1–9, 2023, doi: 10.59966/pandu.v1i4.965.

[2] O. Nazarbek Bakytbekovich *et al.*, "Distractor Analysis in Multiple-Choice Items Using the Rasch Model," *Int. J. Lang. Test. Spec. Issue*, 2023.

[3] A. D. E. Obinne, "Using IRT in Determining Test Item Prone to Guessing," *World J. Educ.*, vol. 2, no. 1, pp. 91–95, 2012, doi: 10.5430/wje.v2n1p91.

[4] C. J. Lee, "The test taker's fallacy: How students guess answers on multiple-choice tests," *J. Behav. Decis. Mak.*, vol. 32, no. 2, pp. 140–151, Apr. 2019, doi: 10.1002/bdm.2101.

[5] R. F. Burton, "Misinformation, partial knowledge and guessing in true/false tests," *Med. Educ.*, vol. 36, no. 9, pp. 805–811, 2002, doi: 10.1046/j.1365-2923.2002.01299.x.

[6] A. Isgiyanto, "Perbandingan Penyekoran Model Rasch dan Model Partial Credit pada Matematika," *J. Kependidikan*, vol. 43, no. 1, pp. 9–18, 2013.

[7] C. I. Ramadani, E. Purwaningsih, and E. Latifah, "Gender Differences in Metacognitive Awareness : A Study on Pre-Service Physics Teachers," vol. 11, no. 1, 2025.

[8] D. Hartanti, T. Djudin, and S. Mursyid, "ANALISIS TINGKAT BERPIKIR DALAM MENYELESAIKAN SOAL GERAK PARABOLA MENGGUNAKAN TAKSONOMI STRUCTURE OF THE OBSERVED LEARNING OUTCOMES (SOLO) SISWA KELAS X MIA SMAN 1 SUNGAI RAYA," *J. Inov. Penelit. dan Pembelajaran Fis.*, vol. 2, no. 1, p. 1, Jan. 2021, doi: 10.26418/jippf.v2i1.44591.

[9] Sumintono, B, & Widhiarso, W. Aplikasi Pemodelan Rasch pada Assessment Pendidikan. Cimahi: Trim Komunikata, 2014.

[10] E. Putri Azrai, G. Sulistianingrum, P. Studi Pendidikan Biologi, and F. Matematika dan Ilmu Pengetahuan Alam, "Ragam Gaya Belajar Siswa SMA Menurut David Kolb dalam Pembelajaran Biologi," 2018.

[11] M. Safihin, H. S. Tiur Maria, and H. Program Studi Guruan Fisika FKIP Untan Pontianak, "PENGEMBANGAN TES MENGGUNAKAN MODEL RASCH MATERI GAYA UNTUK SMA."

[12] B. Hayat, "Adjustment for guessing in a basic statistics test for Indonesian undergraduate psychology students using the rasch model," *Cogent Educ.*, vol. 9, no. 1, 2022, doi: 10.1080/2331186X.2022.2059044.

[13] D. Sugiyono, "Metode penelitian pendidikan," 2014.

[14] H. Hamdani, S. Mursyid, J. Sirait, and E. Etkina, "Analisis Hubungan antara Sikap Penyelesaian Soal dan Hasil Belajar Mahasiswa Calon Guru Fisika," *J. Penelit. Pengemb. Pendidik. Fis.*, vol. 3, no. 2, pp. 151–156, 2017, doi: 10.21009/1.03205.

[15] W. N. Ady, "Analisis Kesulitan Belajar Siswa SMA terhadap Mata Pelajaran Fisika pada Materi Gerak Lurus Beraturan," *J. Pendidik. dan Ilmu Fis.*, vol. 2, no. 1, p. 104, Jun. 2022, doi: 10.52434/jpif.v2i1.1599.

[16] P. Spradley and M. Huberman, "Kajian Teoritis tentang Teknik Analisis Data dalam Penelitian Kualitatif :," vol. 1, no. 2, pp. 77–84, 2024.

[17] D. Ristianingsih, Erwina & Sulisworo, "Analisis faktor pengaruh keberhasilan belajar siswa SMA pada mata pelajaran fisika," vol. 25, pp. 504–510, 2018, [Online]. Available: http://www.seminar.uad.ac.id/index.php/quantum/article/view/305

[18] R. A. Jafar, M. Mansyur, and T. Pristiwaluyo, "Konsistensi Peserta Dalam Menjawab Soal USBN IPA Tingkat SD Dengan Menggunakan Metode Person Fit," *Univ. Negeri Makassar*, no. 2, 2019, [Online]. Available: http://eprints.unm.ac.id/12885/

[19] T. W. Chiu and G. Camilli, "Comment on 3PL IRT Adjustment for Guessing," *Appl. Psychol. Meas.*, vol. 37, no. 1, pp. 76–86, 2013, doi: 10.1177/0146621612459369.

[20] M. R. S. S. N. Ayub, E. Istiyono, S. Munadi, C. Permadi, A. Pattiserlihun, and D. N. Sudjito, "Analisa Penilaian Soal Fisika Menggunakan Model Rasch Dengan Program R," *J. Sains dan Edukasi*

Sains, vol. 3, no. 2, pp. 46–52, Oct. 2020, doi: 10.24246/juses.v3i2p46-52.
[21] R. H. Fadlika, R. Mulyani, and T. N. S. Dewi, "Profil Kemampuan Literasi Sains Berdasarkan Gender di Kelas X," *Quagga J. Pendidik. dan Biol.*, vol. 12, no. 2, p. 104, 2020, doi: 10.25134/quagga.v12i2.2326.
[22] A. 'Afifah, C. Hiltrimartin, and S. Somakim, "KEMAMPUAN PEMECAHAN MASALAH SISWA MELALUI STRATEGI MENEBAK DENGAN CERDAS DAN MENGUJINYA," *AKSIOMA J. Progr. Stud. Pendidik. Mat.*, vol. 10, no. 3, p. 1635, Oct. 2021, doi: 10.24127/ajpm.v10i3.3851.
[23] M. S. Alnasraween, M. S. Alsmadi, H. S. Al-Zboon, and T. O. Alkurshe, "The Level of Universities Students' Test Wiseness in Jordan during Distance Learning in Light of Some Variables," *Educ. Res. Int.*, vol. 2022, 2022, doi: 10.1155/2022/6381857.
[24] Y. Attali and M. Bar-Hillel, "Guess where: The position of correct answers in multiple-choice test items as a psychometric variable," *J. Educ. Meas.*, vol. 40, no. 2, pp. 109–128, 2003, doi: 10.1111/j.1745-3984.2003.tb01099.x.
[25] "XiangyiLiao dan Daniel M Bolt, Universitas Wisconsin-Madison Tebakan dan Kesalahan sebagai Fenomena Terkait Kemahiran dan Dampaknya pada Invariansi Parameter," 2024, doi: 10.1111/emip.1260.
[26] Khaerudin, K. TeknikPenskoranTesObyektif Model PilihanGanda. Madaniyah, 6(2), 183-200. 2016.
[27] A. Al Fraidan, "Interplay of language proficiency, gender, test anxiety, and cognitive strategies: The spectrum of guessing behaviors in multiple-choice assessments among Saudi EFL learners," *Edelweiss Appl. Sci. Technol.*, vol. 8, no. 6, pp. 1148–1161, 2024, doi: 10.55214/25768484.v8i6.2217.
[28] J. Parkes and D. Zimmaro, *Learning and assessing with multiple-choice questions in college classrooms*. 2016. doi: 10.4324/9781315727769.
[29] R. Azizah, L. Yuliati, and E. Latifah, "KESULITAN PEMECAHAN MASALAH FISIKA PADA SISWA SMA THE PHYSIC PROBLEM SOLVING DIFFICULTIES ON HIGH SCHOOL STUDENT," *J. Penelit. Fis. dan Apl.*, vol. 5, no. 2, 2015, [Online]. Available: http://journal.unesa.ac.id/index.php/jpfa
[30] Q. Guo, H. Li, and S. Zhu, "Understanding the Characteristics of Students' Behavioral Processes in Solving Computational Thinking Problems Based on the Behavioral Sequences," *J. Educ. Comput. Res.*, Oct. 2024, doi: 10.1177/07356331241251397