STUDENTS' PERCEPTION ANALYSIS ON THE IMPLEMENTATION OF CASE METHOD IN GENERAL PHYSICS AND TEACHING AND LEARNING COURSES

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Abstract: This research aims to determine students' perceptions of implementing the case method in general physics and teaching and learning lectures. This research was carried out in July 2023. This research involved 32 first-year students of Biology Education, FKIP UMRAH as research subjects. This research is descriptive research with a quantitative approach. Data was collected through questionnaires to measure student perceptions, including ease, mastery of material, satisfaction, lecturer performance, motivation and activeness. Data were analyzed descriptively. The research results show that students have a very good perception of implementing the case method in general physics lectures and teaching and learning. The percentage of student perceptions regarding implementing the case method in general physics lectures and teaching and learning is not much different. In the indicators of ease, satisfaction, motivation and activeness, Studying and Learning show a higher percentage of perceptions, while for indicators of material mastery and lecturer performance, general physics shows a higher percentage of perceptions. This shows that implementing lectures using the case method is suitable for stimulating activity and increasing students' understanding of concepts in both subjects, such as general physics, and non-exact subjects, such as teaching and learning.

Keywords: *case method,* general physics, students' perception, teaching and learning

INTRODUCTION

Learning is a process of behaviourchange that occurs due to a person's interaction with the surrounding environment[1].Behaviourchanges related to learning outcomes are sustainable, positive, functional, active and goal-directed. The process of changing behaviourcan occur under different conditions[2]. Learning is an interactive process between students and educators supported by methods, learning resources and the learning environment[3]. The learning and learning process is then considered successful and can be proven from the extent to which educational goals have been achieved. Education is considered one aspect of progress in a country because education can improve the quality of human resources. By studying, someone can improve their understanding and critical thinking abilities[4]. By achieving these learning objectives, the teacher can successfully and effectively implement learning in the classroom[5]. Learning is said to be effective if there is interaction between the components in learning[6].

Effective communication is about arranging words and how to interpret information[7].Perception is a process that occurs when someone observes another person or an object[8].Understanding the information being communicated or collaborating with other people to convey information causes each person not to be isolated from the perception process[9].Perception is called the essence of communication. Recognition can decide whether a message will be selected or ignored in communication[10].The greater the perceived similarity between individuals, the easier and more frequent communication will occur and the greater the possibility of forming cultural or identity groups [11].

Several factors differentiate one person's perception from the perception of others.These factors include personal characteristics, the object or target of recognition, and the situation [12].Those who receive treatment from the environment try to use personal characteristics to provide an interpretation of the treatment. In its interpretation, people are influenced by personal characteristics such as attitudes, motives, interests, experiences and hopes[13].

The recognition target is usually an event, object, or even person. The characteristics of an object that is perceived can influence a person's perception[14]. Perceptions need to be seen realistically depending on the situation and environmental conditions. This has an impact when the situation is made the focus, resulting in a perception based on support from the situation[15]. Awareness is always associated with a desire to learn. This aims to achieve the desired learning processes and outcomes, especially in courses that require critical, rational and logical thinking skills. Motivation is the driving force that encourages a person to fulfil his obligations and is the cause and effect of his interaction with the situation he faces. Therefore, supported by strong awareness and motivation, national education can be created and advanced[16].

Positive or good perceptions of learning are very important to form in students. One of the unfavourable perceptions of the learning carried out indicates the need for improvements in a provision so that students can achieve learning goals[17], [18]. On

the other hand, good and positive perceptions of learning indicate student satisfaction with learning and achievement of learning objectives [13], [19].

Many methods can be applied at the lecture level to ensure students' learning process is understood well[20].One method that can be applied is the case method. This method is recommended by the Directorate General of Higher Education, Research and Technology because it is one of the assessment indicators for the Main Higher Education Performance Index [21].This method is implemented to improve critical thinking skills, solve problems, find solutions to problems, and build students' communication skills[22].Implementing learning using this method supports the development of 21st-century skills[23]–[25]. Thecase method can encourage students to develop thinking skills and understand learning material better [26].

In its implementation, the application of the case method must, of course, be evaluated. One of them is measuring the perception of students who are always learning subjects and participate in a series of learning activities using this method. These include prospective teacher students, such as Biology Education Study Program students. Even though biology is an exact subject that is part of the natural sciences (IPA) family, in its curriculum, the biology education study program also studies non-exact subjects related to developing pedagogical skills. A prospective biology teacher must understand the learning material and how the material should be taught through learning. In semester 2, prospective biology teachers take various courses, including General Physics, an exact subject, and teaching and learning, a non-exact subject. Both courses are implemented using the case method. Regarding such contrasting material coverage, is the case method applied effectively in these two courses? To answer this question, researchers conducted researchto analyze students' perceptions of implementing the case method in general physics lectures and teaching and learning. The results of this perception measurement will certainly be a good evaluation material for teachers in applying the case method in exact and non-exact courses.

RESEARCH METHOD

This research is descriptive research. This study uses a quantitative approach. This research was conducted in July 2023 at the Biology Education Study Program, Faculty of Teacher Training and Education, Raja Ali Haji Maritime University (FKIP UMRAH). This research involved 32 first-year students taking Physics and Teaching and Learning courses. Research data was collected using a questionnaire. The main indicators for measuring perceptions include ease, material mastery, satisfaction, lecturer performance, motivation and activeness [27]. The data collection instrument grid can be seen in Table 1:

Table 1. Research instrument grid

Indicators	Number of question items
Ease	2
Material mastery	2
Satisfaction	2
Lecture performance	3
Motivation	5
Activeness	4
Total	18

Perception measurement through questionnaires using a Likert scale [28]. The scales used are 4 scales. Each statement is assessed using the scale shown in Table 2.

Table 2. Perception rating scale

Rating scale	Favorable	Unfavorable
Strongly agree	4	1
Agree	3	2
Disagree	2	3
Strongly disagree	1	4

This research data was analyzed descriptively by presenting it as it is without testing hypotheses or connecting it with other variables [29]. Student perceptions for all indicators are calculated as total percentages using the following formula.

$$P = \frac{f}{N} \times 100\%$$

Information:
P = Percentage of total perception
f = resulting perception score

N = total perception score
The total percentage of student perceptions is categorized from very good to very bad. The categorization of student perceptions can be seen in Table 3 below[30].

Table 3. Perception category

Perception category	Percentage (%)
Very good	$81,25 < P \leq 100$
Good	$62,50 < P \leq 81,25$
Bad	$43,75 < P \leq 62,50$
Very bad	$25 < P \leq 43,75$

RESULTS AND DISCUSSION

The results of this research will describe each main indicator of perception assessment for both courses, general physics and study and learning. The research results will be explained as follows.

1. Ease

Regarding convenience indicators, the total percentage of student perceptions regarding implementing the case method for general physics lectures and teaching and learning has a slight difference in percentage. The difference is very slight, no more than 5%. The total percentage of perceptions in both courses can be seen in Figure 1
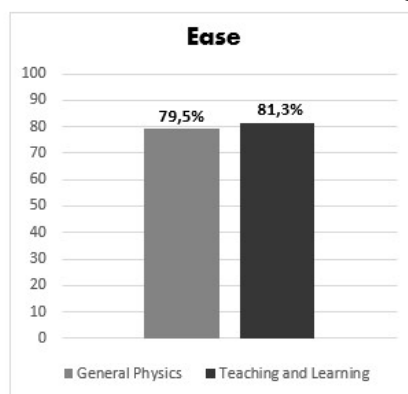

Figure 1. Percentage of student perceptions for the Ease indicator

Figure 1 shows that even though there is a very small difference in percentage, student perceptions in the two courses are in different categories. Judging from the percentage, students' perceptions of the ease indicator are in the good category for general physics courses and the very good category for teaching and learning courses. This result is unsurprising because many students find exact subjects, such as general physics, more difficult than non-exact subjects[31], [32]. Apart from that, exact subjects synonymous with mathematics also complicate exact subjects such as physics, which predominantly use mathematics because mathematics is still considered a scourge for many students [33]–[35], even for students majoring in exact sciences.

However, the good category alone shows a positive perception towards implementing the case method in exact courses such as general physics. In applying the case method. Using appropriate cases and structured problem-solving will make learning using the case method easier for students to follow. This certainly impactsstudents' perceptions of learning participation[36], [37].

2. Material Mastery.

The results for the material mastery indicator are the opposite of the ease indicators. On the ease of material indicator, students' perceptions of implementing the case method in general physics lectures show higher results than teaching and learning lectures. This can be seen in Figure 2 below
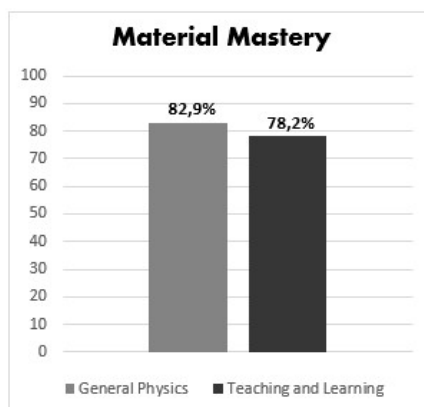

Figure 2. Percentage of student perceptions for indicators of material mastery.

Figure 2 shows that for indicators of material mastery, student perceptions are in the very good category for general physics lectures and the good category for teaching and learning lectures. Even though there are differences in categories, this still shows that applying the case method shows positive perceptions from students in both exact courses (general physics) and non-exact courses (teaching and learning). The difference is not that big, no more than 5%.

In applying the case method to solve cases, students must have an initial understanding of concepts related to the case. This initial understanding was obtained from previous levels of education [38], [39]. In this case, of course, the percentage of students'materialmastery shows a better percentage because students have studied physics in junior high school, which is different from the teaching and learning subjects that students have just acquired in college, so students do not have the prior knowledge related to it. However, these results show that applying the case method can improve students' material mastery; this is also in line with the results of previous research[40], [41].

3. **Satisfaction.**

In this indicator, both student perceptions of general physics lectures and studying and learning are in the same category, namely the good category. The difference in perception percentage in both subjects is also not that big, not more than 5%. The percentage of perceptions of the two courses can be seen in Figure 3.
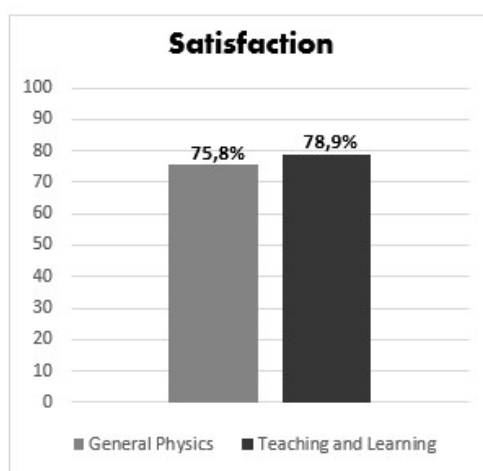

Figure 3. Percentage of student perceptions for indicators of material mastery.

Even though it is not in the very good category, these results still show a positive perception of implementing the case method in general physics courses and teaching and learning. This level of satisfaction depends on the implementation of the learning carried out. If the implementation of learning is deemed suitable and in accordance with student expectations, students will certainly feel satisfied [42], [43]. Case-method learning has been implemented in this case as it should invite students to discuss variouscaserelated to lecture topics.

4. **Lecturer Performance.**

The research results show a positive perception of this indicatorin both courses. In general physics and teaching and learning courses, the percentage of student perceptions is very good. This can be seen in Figure 4
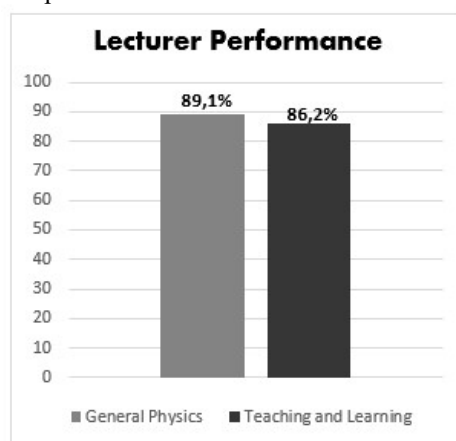

Figure 4. Percentage of student perceptions for lecturer performance indicators.

Lecturer performance is an important aspect of implementing learning. One of the things is related to the lecturer's ability to teach and communication skills [44]. The ability of lecturers to design and implement learning using the case method is also one of the demands of the ministry and is an indicator of IKU assessment[21]. For this reason, lecturers should be accustomed to applying the case method when conducting lectures. This research shows that the lecturers did their best to hold lectures using the case method.

5. Motivation

In this indicator, the percentage of student perceptions in general physics courses and study and learning is almost exactly the same. The difference between the two is no more than 1%. This can be seen in Figure 5
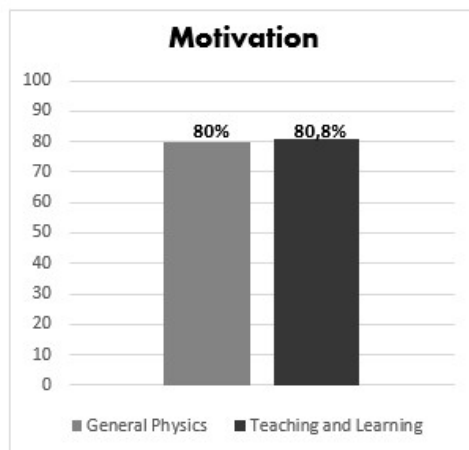

Figure 5. Percentage of student perceptions for motivation indicators.

In Figure 5, it can be seen that students' perceptions of implementing the case method in general physics lectures and teaching and learning are both in the good category. This shows that implementing the case method in these two courses can motivate students to learn. Several previous research results also show that applying the case method in learning can increase students' motivation in learning[16], [45]. In applying the case method, using cases related to students' daily lives will arouse curiosity and motivate students to solve these problems[46], [47]. This motivation is very important for students because it will impact learning outcomes, includingmaterialmastery [48]. This also aligns with the research results, which show that students have a positive perception of motivation and mastery of the material.

6. **Activeness**.

For this indicator, the differences in the percentage of student perceptions are small, namely less than 2%. Even so, the percentage of student perceptions in the two courses is in different categories. This can be seen in Figure 6
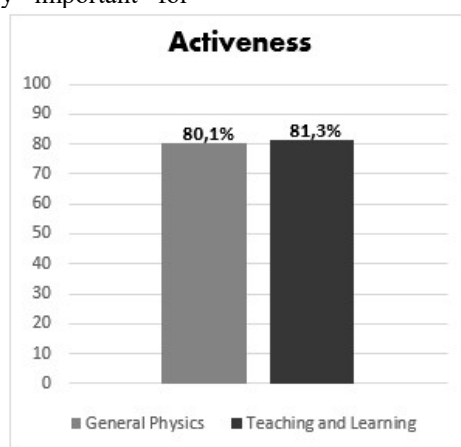

Figure 6. Percentage of student perceptions for activeness indicators

In Figure 6, it can be seen that student perceptions are in the Good category for general physics lectures and the very good category for study and learning lectures. However, just like the previous 4 indicators, in this indicator of activity, student perceptions also show positive perceptions. Case method lectures stimulate student problem-solving activity[49], [50]. The research results show that students have greater activeness in lectures and learning compared to general physics. This is understandable because general physics cannot be separated from mathematical procedures in solving cases, decreasing student activity. The exact courses are known to be difficult because they involve

mathematics in the problem-solving process [51]–[53]. This low level of activity is also demonstrated by research findings regarding various problems in physics learning[54]–[60]. However, the results of this research show that student activity is still in the good category. It can also be seen that students perceive the very good category in terms of material mastery indicators. This is in line with research findings, which show increased activity andmaterialmastery[61].

CONCLUSION

Based on the research results, it can be concluded that overall, students have a positive perception of implementing the case method in general physics lectures and teaching and learning lectures. This can be seen from the percentage of student perceptions on all perception indicators, where no single indicator shows perceptions in the not-good or very bad category. For general physics lectures themselves, there is a very good perception regarding the indicators of material mastery and lecturer performance; then, the perception is in the good category for the other four perception indicators. For lectures and learning, there is a perception in the very good category for the indicators of convenience, lecturer performance, and activeness, as well as a perception in the good category for the other 3 perception indicators. This shows that implementing the case method can be applied to both exact subjects, such as general physics, and non-exact subjects, such as teaching and learning.

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