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Identification of Student Difficulties in The Implementation of Basic Physics Lecture

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Abstract: The objective of this research is to find out the causes of low student learning outcomes in the Basic Physics course in the physics Education Dept. University of Mataram in 2021. This type of research is a qualitative descriptive that examines the main problems related to the difficulties of the study of physics. The research population was all students in the Physics Education Dept, University of Mataram who took the Basic Physics course. The research sample was students who took the short semester course in the Basic Physics course using the purposive sample technique. While the research instrument used is in the form of a questionnaire whose answers have been provided, so that respondents just choose the options that have been provided. The results of the analysis show that learning difficulties in studying mechanics lie in the basic mathematical abilities, namely differential and integral. Thus, teachers need to develop learning strategies so that students' thinking skills in solving problems are increasing.

Keywords: Learning difficulties; Mechanics; Physics

Introduction

Basic Physics Subject 1 in the Physics Education Dept. University of Mataram is one of the mandatory courses, which has 3 credits, which is divided into laboratory practice (1 credit), and classical course.(2 credits). This two kind of lecture is still not effective. This is shown, among others, the grade is quite lace, with average grade of 50 (Source: Academic Section of Education Faculty, University of Mataram, 2020).

Based on these data learning outcomes of the Physics Education Dept. University of Mataram in the Basic Physics Subject 1 still needs to be improved. For this reason, optimal efforts are needed, both by lecturers, and students in the implementation of the teaching and learning process and institutions related to facilities and infrastructure. It is expected that cooperation between lecturers, students, and institutions can create effective teaching and learning processes. To create an effective teaching and learning process, it is necessary to do research on several causes of low student achievements in the Basic Physics Subject .

The purpose of this study is to find out the causes of the low learning outcomes of students in the Basic Physics course in Physics Education Dept, University of Mataram in 2021. The objective of this study will be beneficial for efforts to improve the quality of teaching and learning process at Education Faculty University of Mataram, especially in the basic physics subject. In addition, the findings of this study will also be useful to improve the quality of the learning process in other sabjects.

Learning difficulty refer to a group of difficulties manifested in the form of real difficulties in the skills and use of listening skills, gathering, mandating and also understanding mathematics (Mulyono, et al 2013). He also argues that learning difficulties are related to conditions in which students cannot learn as they should, which are not always caused by low inlegence factors (mental abnormalities), but can also be caused by factors that are non-intelligence. Thus, high IQs do not guarantee the success of students' learning. Fitria and Malik (2002) states that the causes of students having difficulties in developing logical thinking are not used to solving problems in natural science that need

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logical thinking. In addition, students are less creative in choosing or looking for the right strategy for the problems given. Finally, students are less thorough in solving problems in natural science.

Meanwhile learning outcomes are defined as the ability or change of one's behavior after following the learning process (Sani, 2016). If a person's behavior changes for the better, it can be concluded learning process is successful. Changes in behavior include aspects of knowledge, skills, and attitudes. Hayati (2017) states that learning outcomes are patterns of deeds, values, understanding, attitudes, appreciation and skills. According to Gagne there are five abilities related to the learning outcomes of learning outcomes, i.e intellectual skills, cognitive strategies, attitudes, verbal information, and motor skills (Dahar, 2011). Nurkancana (1986) argues that learning outcomes are the results that have been achieved individually after the person concerned experiences a learning process. Thus, the high and low learning outcomes achieved by students depend on the results achieved by students after they follow the teaching and learning process.

While in the short term, learning outcomes are assessed from the level of mastery on the specific subject matter. Usually due to aspects of behavior that are considered more focused on cognitive abilities at the level of knowledge and understanding (Sujana and Ibrahim, 2001).

To find out the results achieved by the student, Arikunto (2016) state that it can be done with an evaluation instruments, which has the ability to evaluate something with the results such as evaluated conditions, which can be done by non -test techniques and test techniques. The evaluation should be carried out regularly, which includes assignments or quiz, midterm examination, and final semester exams. In addition, laboratory practicum activities also need to be evaluated, especially aspects of skills and attitudes. The results of the final evaluation are a combination of the evaluation results of the activities and laboratory practicum activities. Based on the academic guidelines of the Education Faculty, University of Mataram in 2020, the results of the final evaluation determined the weights classical lecture credits multiplied by the grade of the evaluation added the weight of the laboratory practicum credits multiplied by the grade of the laboratory practicum evaluation, then divided by the total credit of the course.

According to Slameto (2010) learning outcomes are influenced by several factors, but can be classified into two, namely internal factors and external factors. Internal factor .consist of factors originating from student's situation, which include physical factors (health, body defects), psychological factors, which include intelligence, attention, interests, talents, motives, maturity, readiness and fatigue factors, which include physical fatigue and psychological fatigue. Then external factors, namely factors originating from student's environment, which include family, college, and community.

In line with (Slameto, 2010; Sriyanti, 2011; Abdurrahman, 2012) stated in general, learning success was influenced by external and internal factors. External factors are the factors that are outside the individual. In the learning process at school, external factors namely factor that are outside of students. External factors consist of nonsocial factors and social factors. Then internal factors are the factors that exist in individuals who are learning. Internal factors consist of physiological factors and psychological factors. External and internal factors affect learning success, the advisor can be positive-supporting, but it can also be negative-inhibition.

Method

This type of research is descriptive research, which is research that describes something, for example term, conditions, situations, events, activities and others (Arikunto, 2020). In this case, researchers try to explore, describe, and interpret existing data or describe the state and condition of the phenomenon that is to know things related to the data and situation.

The research population is all students in the Physics Education Dept. Education Faculty, University of Mataram that takes the Basic Physics subject. The research sample is taken purposive sample (aimed sample) with consideration for certain reasons in accordance with the purpose of this research (Arikunto, 2020). The research sample is students who take Short Semester Lectures in Basic Physics Subjects. The research instrument used is in the form of a questionnaire that has been provided the answer, so that the respondents only need to choose the options provided. The results of the questionnaire were analyzed using a qualitative formula percentage (Sujana, Ibrahim, 2001: 129) as equation 1.

$$p = \frac{f}{N} \times 100\% \quad (1)$$

Where P is a proportion that is expressed by percent, f is the number of answers given by respondents, and N is the number of samples.

Result and Discussion

This study examines the main problems related to the difficulties of students of Physics Education Dept. University of Mataram, who have taken basic physics courses but in general have not succeeded in achieving the learning achievements yet. To find out this problem,

the researcher explores the opinion of students participating in the 2021 Inter-Semester Lecture as a research sample in the form of a questionnaire that has been provided, so that respondents only need to choose the options provided.

The results of this study indicate that the dominant cause of internal factors for the unsuccessful student in pursuing this course is that nearly 61% of students say the basic physics course is difficult to learn, although 81.5% of students prefer this course. This is reasonable because the basic physics course requires students to have the ability to analyze formulas, derive formulas, and memorize them (Nurfinda, 2020). Another cause is that most (63 %) students claim to not prepare themselves optimally before attending lectures. Even though readiness of learning has a significant impact on student learning achievement (Idamayanti, 2020).

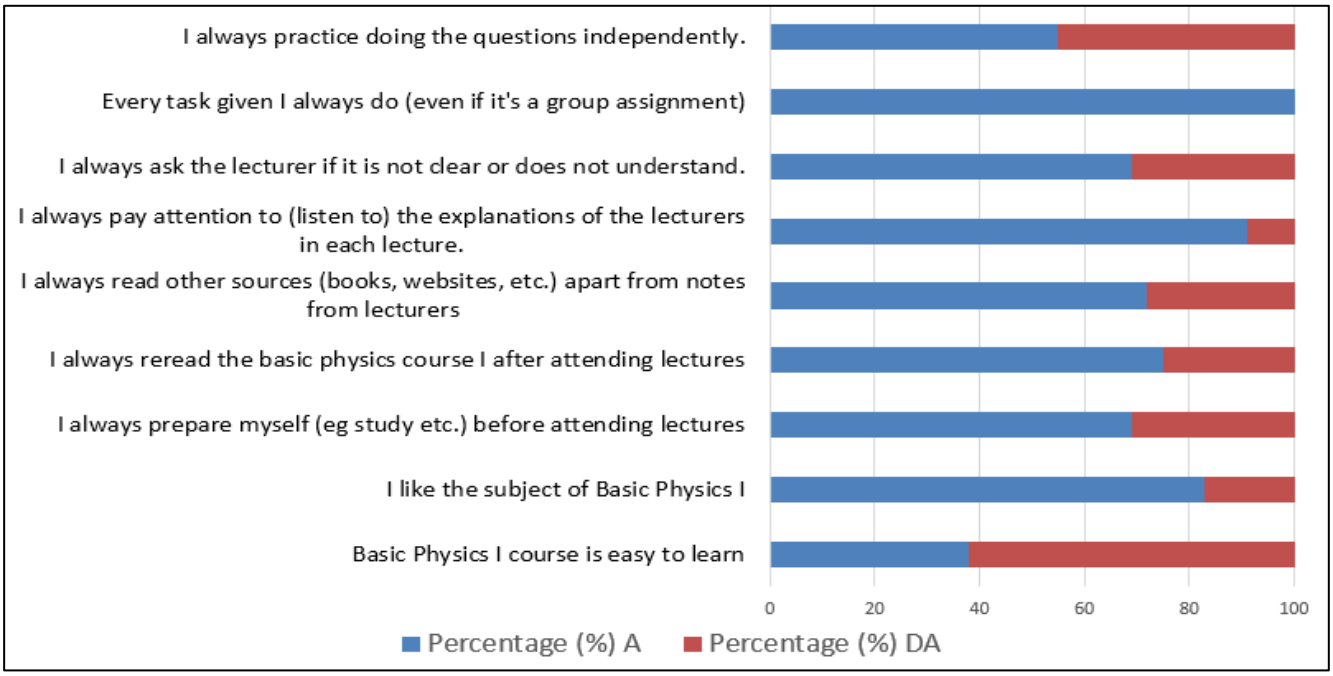

Figure 1. Internal factors that determine difficulty of study

The preparation in question includes the reading activities (topics) of lectures to be discussed. Students also admit that they rarely practice working on questions independently, even though group assignments are always completely done (92%). Even though practicing solving problems is very important, because it has a significant effect on learning outcomes (Islahudin et al, 2013).

The next internal factor is that almost half of students claim to rarely ask the lecturer if the subject is not clearly understood yet or does not understand the lecturer's explanation. The reluctance of students to ask questions, among others, because they do not know what to ask, and feel shy to ask. Students' skills in questioning are very important because they have a positive correlation with student learning outcomes, even though they are still in the moderate category (Septaria., 2022). Therefore, lecturers need to provide motivation for students to asking questions when they experience difficulties in learning.

The cause of external factors of unsuccessful students in pursuing this course are students not able to solve the questions that have been developed from the questions that have been discussed (74% of respondents). Some ways to overcome this problem include, lecturers can apply causalitic learning models developed by Rokhmat (2019), because this model can improve students' reasoning abilities (Nurjamilah et al., 2020). Increasing the ability of students in thinking logically will make it easier for students to solve the exam questions that have been developed. In addition, lecturers need to use the ICP (inquiry creative process) learning model because this ICP model has a significant effect on critical thinking skills (Wahyudi et al., 2019), because critical thinking skills make students think regularly and systematically so that they can draw conclusions objectively (Fatimah et al., 2016).

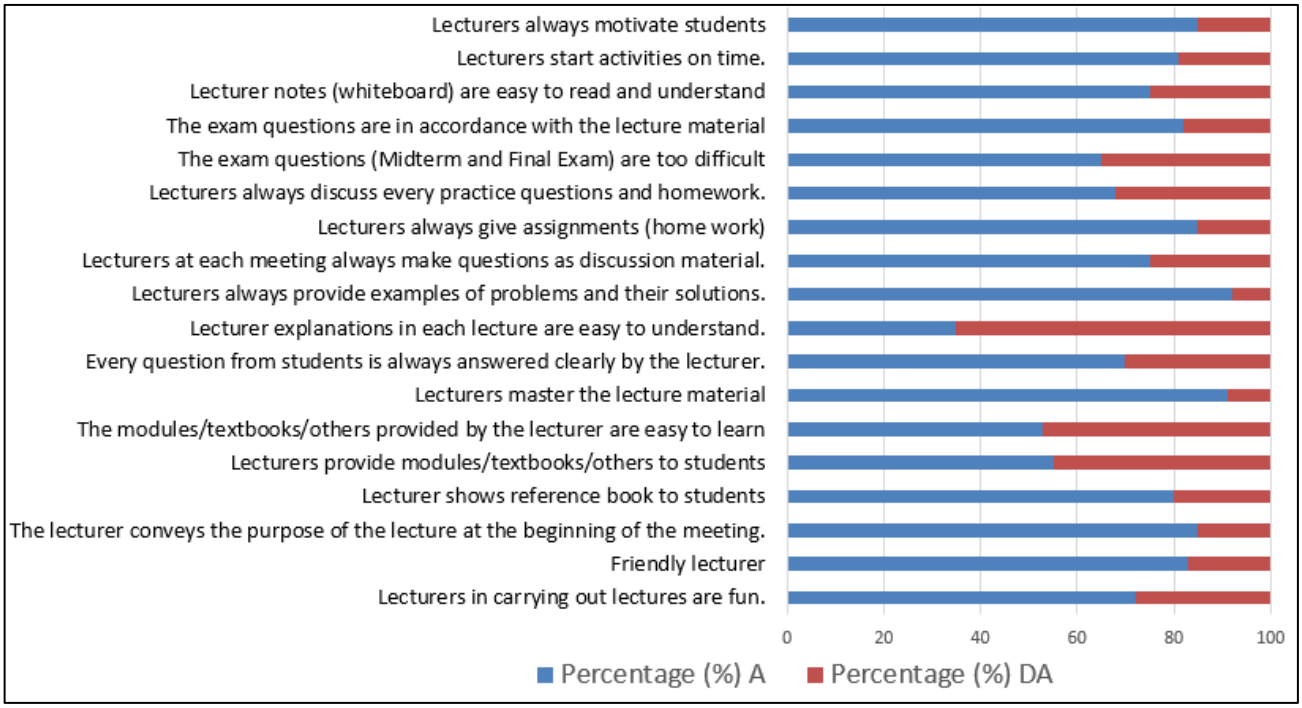

Figure 2. External factors that determine difficulty of study

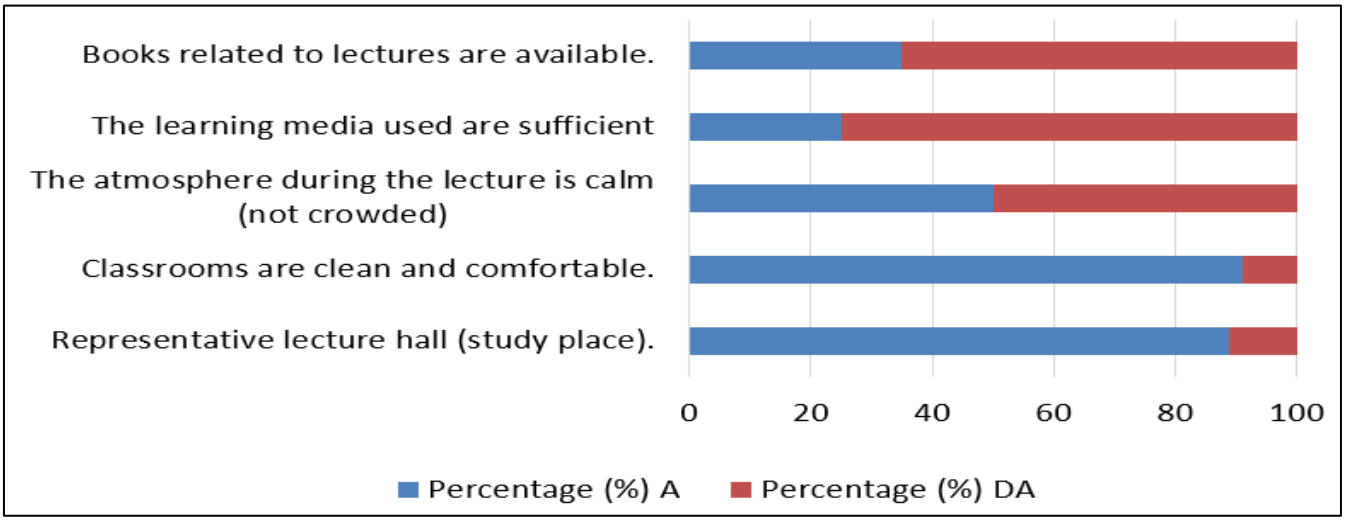

Figure 3. Supporting factors that determine difficulty of study

Other factors shown 80% of respondents admitted that the use of learning media is not enough in helping teaching and learning activities in the classroom. They argue to need additional learning media, for example LCD, TV, and multimedia. The use of multimedia as a learning media can improve student learning outcomes (Setiawan et al, 2016). Increased learning outcomes occur because multimedia gives a new dimension of words, i.e. bringing these words into motion pictures with sounds, music, and videos (Munir, 2015).

In addition, 66 % respondent state that lack of additional books related to learning materials. To solve this problem, lecturers have made a lecture module for supporting courses. even though 58% of respondents said that the modules provided by the lecturer were still difficult to understand. To overcome this problem, Kosasih (2021) explains that a good module, must attract the interest of the reader provide motivation, contain interesting illustrations and consider linguistic aspects so that they are suitable with the ability of the readers and are able to stimulate the personal activities of the reader. Therefore the use of suitable modules will be able to improve students' cognitive learning outcomes (Fatmi et al, 2021).

Supporting factors which include representative leaning rooms (89%), comfortable and clean (90%), and a quiet classroom atmosphere (50%) have been fulfilled. This is important due to these learning facilities have a positive correlation with learning motivation and learning motivation has a positive correlation with

student physics learning outcomes (Reski, A. 2018). In other words, learning facilities are positively correlated to (although indirectly) students' achievement.

Conclusion

The results of this study indicate that students' learning difficulties in the subject of basic physics are due to internal factors, external factors and supporting facilities Internal factors have the greatest influence, namely 81.5% while external factors are 74% and supporting facilities are 58%. The result of this research should be used by University of Mataram as recommendation to ensure more qualified learning in Basics Physics subject.

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