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ANALYSIS OF STUDENT LEARNING PROBLEMS IN ENTOMOLOGY LECTURES

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ABSTRACT

The main problem in Entomology lectures is the low level of active participation among students and their difficulty in understanding the material on insect classification and morphology. This has an impact on suboptimal learning outcomes and student interest in the field of entomology. The urgency of this research lies in the importance of identifying factors that hinder the learning process as a basis for developing more effective and relevant learning strategies. The objective of this study is to analyze students' learning problems in Entomology courses based on their own perceptions. This study uses a survey method with a descriptive quantitative approach. The main instrument is a closed-ended questionnaire covering five aspects of learning problems: understanding of material, learning media, teaching methods, availability of learning resources, and learning motivation. The research subjects consisted of 93 students from the Biology Education Program at FITK UINSU in the even semester of the 2024/2025 academic year who were enrolled in Entomology courses. The analysis results showed that 68% of students experienced difficulties in understanding insect classification material, 54% stated that learning media were uninteresting, and 47% considered the teaching methods used by lecturers to be insufficiently varied. The conclusion of this study indicates that students' learning challenges in Entomology lectures remain significant and diverse, necessitating the development of interactive learning media and innovative pedagogical strategies to enhance the effectiveness of the learning process.

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INTRODUCTION

The Entomology course plays a vital role in the biology education curriculum because insects play a significant ecological role and are often used as study materials to deepen understanding of scientific concepts such as classification, morphology, and adaptation of living organisms (Kurniawati & Safitri, 2023). However, in reality, the teaching of Entomology at the university level still faces various challenges that impact students' learning outcomes. This aligns with findings from a study conducted by Ramadhani and colleagues. The 2021 study revealed that biology students tend to struggle with understanding insect classification material and face limitations in accessing hands-on learning opportunities.

One of the main factors causing this problem is the lack of interest and motivation among students to learn entomology. Research conducted by Sutisna & Dewi (2020) revealed that most students feel uncomfortable studying insects due to negative perceptions, such as disgust or the irrelevance of the material to their practical needs (Sutisna & Dewi, 2020). These negative perceptions are further exacerbated by the lack of active learning methods and engaging field experiences during the lecture process (Nurjanah, dkk., 2022). The inability to innovate in the delivery of material causes students to become less active and not fully engaged in the learning process.

In addition to motivation issues, a lack of facilities is also a significant obstacle. According to research conducted by Maulidah and Rahman (2023), most universities in Indonesia do not have entomology laboratories and sufficient insect specimen collections to support practical learning (Maulidah & Rahman, 2023). Conversely, the dominant teaching approach, which relies on lectures and static presentations, has exacerbated this situation. This method makes learning impractical and unable to build students' skills in observing and identifying insects.

According to several studies, project-based learning strategies and field activities can increase students' active engagement in understanding entomology concepts (Pratama & Hartati, 2022). Unfortunately, the implementation of these methods is still hampered by geographical conditions and resource limitations faced by institutions. As a result, students do not gain practical experience in directly observing insects, so the learning objectives in the field of biology have not been optimally achieved.

With advances in technology, the use of digital media has emerged as an alternative option for entomology education. Digital applications such as iNaturalist and interactive learning videos can enhance students' understanding of concepts and their interest in learning about insects, according to Putri et al. (2024). Even though learning is conducted online or outside the laboratory, digital media allows students to engage in independent exploration. However, further research is needed to determine how effective these media are as pedagogical support in entomology courses (Putri, dkk., 2024).

In contrast, Woolner (2020) states that there are major problems in teaching entomology in various higher education institutions. This is because there is a discrepancy between field practice and the theory taught in the classroom. Students' inability to understand the real-world applications of the material they study is often due to issues with facilities and conventional approaches (Woolner, 2020). Therefore, a comprehensive study of the various components contributing to students' learning difficulties in entomology classes is necessary.

Based on this background, this study was conducted to analyze the learning difficulties of students in entomology classes. To do this, a questionnaire was used as a survey method. It is hoped that this analysis can specifically identify the elements of difficulty faced by students, including understanding of the material, learning techniques, availability of media, and motivation to learn. This study is expected to serve as a basis for developing more creative and efficient entomology learning strategies in higher education.

METHODS

This study is classified as a survey research, which is a type of research conducted by asking respondents about their characteristics or opinions regarding a particular issue. In this context, the opinions referred to in this study pertain to the challenges faced by students in studying Entomology. The research was conducted in March-April 2023. The population of this study consists of 93 students enrolled in the Biology Education Program at the Faculty of Education and Teacher Training, State Islamic University of North Sumatra. The sample size comprises 51 students selected from the total population.

The data collection technique used a questionnaire on the problems of studying entomology. The questionnaire was validated by experts and met the criteria for use in research. The questionnaire was administered to respondents via Google Forms. The indicators used in the questionnaire can be seen in Table 1.

Tabel 1 Indicators Used in Research Instruments

Aspects	Indicators
Entomology Course Content	Entomology material that is difficult to learn
	Factors contributing to the difficulty of studying Entomology
Entomology Teaching Methods/Strategies	Classroom atmosphere in Entomology lessons
	Types of learning methods/strategies applied in Entomology learning
	The relevance of appropriate learning methods/strategies to be applied in Entomology learning
Media/Learning Resources for Entomology	Types of media/learning resources used in Entomology learning
	The relevance of the types of media/learning resources used in Entomology education

The research data was analyzed by calculating the proportion of respondents' answers. These answers were analyzed using the Miles and Huberman approach, which consists of four research steps: data collection, data reduction, data presentation, and data conclusion. In the data collection stage, data was collected in the field through interviews and questionnaires, followed by the data reduction stage, which involved reducing the data by clearly describing the important points obtained from the research data. Next, data display was carried out to present the data in the form of descriptions and images. In the data conclusion stage, conclusions were drawn and the research data obtained was verified.

RESULTS AND DISCUSSION

Based on the research conducted, the results of the analysis of students' learning

difficulties in taking Entomology courses for each topic studied can be seen in Figure 1.

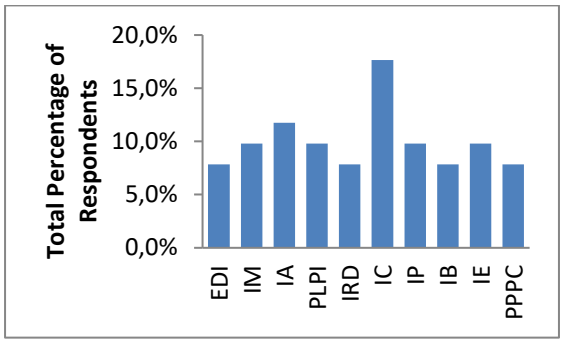

Figure 1 Comparison of the Level of Difficulty of Entomology Material

Abbreviation explanation:
EDI : Evolutionary Development of Insects
IM : Insect Morphology
IA : Insect Anatomy
PLPI : Physiology and Life Processes of Insects
IRD : Insect Reproduction and Development
IC : Insect Classification
IP : Insect Preservation
IB : Insect Behavior
IE : Insect Ecology
PPPC : Principles and Procedures for Pest Control

Based on Figure 1, it can be understood that the Entomology material that students find most difficult to learn is Insect Classification, followed by Insect Reproduction and Development, and Insect Ecology. According to students taking the Entomology course, these topics are perceived as difficult to learn due to several factors, namely: the presence of many foreign terms that are hard to understand, the material not being taught in detail, and the lack of Entomology learning facilities that could clarify understanding. The same point was also raised by Suryani & Lufri (2021), who noted that foreign terms found in Biology materials can be a source of difficulty for students because they are not familiar with these terms, resulting in the concepts being taught not being conveyed optimally (Suryani & Lufri, 2021). Furthermore, Sani et al. (2019) also added that incomplete teaching content can result in abstract understanding among students (Sani, dkk., 2019).

The efforts needed to overcome students' difficulties in learning Entomology material are the need for strong motivation to study the material comprehensively. This motivation can be stimulated altruistically through an engaging and meaningful learning approach. Entomology, as the science of insects, can be uniquely designed by presenting the material alongside facts and phenomena related to insects, supported by engaging images and videos. This approach prevents students from struggling to memorize foreign terms, as there is already an incentive to help them understand the concepts effectively.

The content of the material can also be arranged in such a way that it meets the course material achievement indicators, accompanied by explanations of unique and interesting facts and phenomena about insects. This aligns with Vasmin et al. (2020), who suggest that one solution to motivate students to learn difficult material is to design it in a unique presentation format, thereby creating a positive impression that encourages students' learning motivation (Yasmin, dkk., 2020). Rahmi & Helendra (2021) also reported that material perceived as difficult to learn can affect students' motivation to learn. Therefore, learning support is needed through content presentation that can stimulate students' curiosity about the material being studied (Rahmi & Helendra, 2021).

Furthermore, an analysis of the problems in Entomology lectures based on the learning methods/strategies applied can be seen in Figure 2

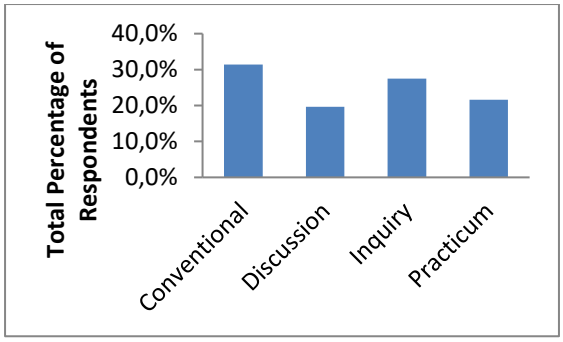

Figure 2 The Most Frequently Implemented Learning Methods/Strategies in Entomology Education

Based on Figure 2, it can be understood that the learning methods/strategies that are often applied in Entomology learning are conventional or lectures. According to the respondents, these methods/strategies are less relevant because they cannot facilitate optimal knowledge development. This aligns with Maryati (2022), who states that the lecture method is not recommended for use in learning because it tends to make students passive and easily bored during lessons (Maryati, 2022). Puspita & Andriani also add that the lecture method has many weaknesses because it is ineffective in developing students' potential and learning outcomes. They only receive material verbally without any active learning activities (Puspita & Andriani, 2021).

Meanwhile, the learning methods/strategies that students are interested in applying to Entomology learning are shown in Figure 3.

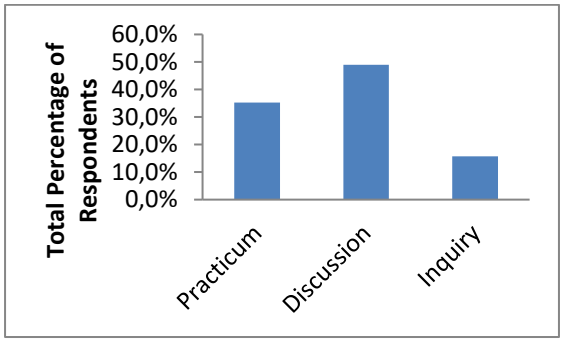

Figure 3 Relevant Methods/Strategies Applied in Entomology Learning

Based on Figure 3, it can be understood that the relevant methods/strategies to be applied in Entomology learning according to the respondents' statements are discussion, practicum, and inquiry. According to them, these learning methods/strategies can create an interactive and interesting classroom atmosphere and facilitate optimal self-development. This aligns with the advantages of each teaching method/strategy. Listiaji & Subhan (2021) state that interactive discussions can have a positive impact on students' mastery of the material because each student gains a clear understanding and is more thorough in developing various problem-solving alternatives (Listiaji & Subhan, 2021).

Furthermore, Suryanti et al. (2019) established that the practicum and inquiry methods intersect in improving students' scientific teamwork attitudes (Suryanti, dkk., 2019). Mupilihah et al. (2022) added that the practicum and inquiry methods involve a series of exploratory activities accompanied by the internalization of scientific thinking attitudes among students. This aligns with the concept of Entomology, which requires realistic activities in examining and understanding insect phenomena to create concrete understanding among students (Muplihah, dkk., 2022).

An analysis of the problems in learning Entomology based on the use of media and learning resources is shown in Figure 4.

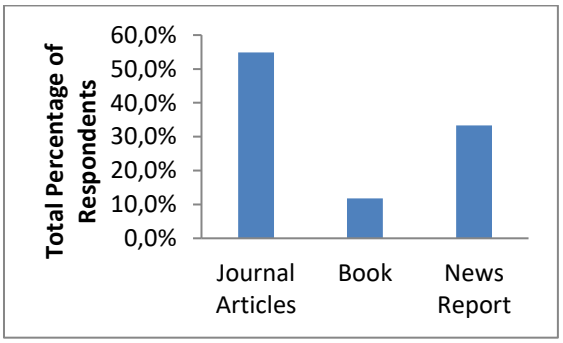

Figure 4 Media and Learning Resources Used in Entomology Education

Based on Figure 4, it can be understood that learning media and resources are used to a limited extent. Materials are often delivered directly by the lecturer, so students need to make a significant effort to review the material that has been discussed. This situation is considered uninteresting by students. This is consistent with Akbar et al. (2022), who state that learners require appropriate media to be implemented in the learning process. This is intended to enable learners to achieve learning objectives to the fullest extent (Akbar, dkk., 2022). Safitri & Panjaitan (2021) also highlight that the use of relevant media is important to enhance learners' interest and improve the effectiveness of material delivery (Safitri & Panjaitan, 2021).

Relevant media and learning resources to be used in Entomology learning according to respondents' statements can be seen in Figure 5.

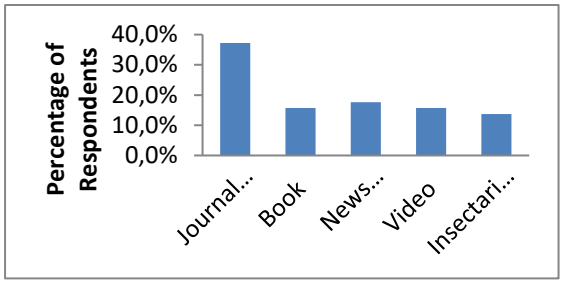

Figure 5 Relevant Media and Learning Resources Applied in Entomology Learning

According to the respondents' statements as shown in Figure 5, relevant media and learning resources for use in Entomology learning consist of ICT and non-ICT types. ICT media and resources that can be used include videos, reputable online articles, e-books, and news reports about insect life that are widely accessible. Additionally, non-ICT media and resources that can be used include hardcopy books and insectariums. ICT media and resources are considered to have many advantages because they can be accessed flexibly, have extensive content, and can enhance students' digital literacy skills.

Wahyuni & Yokhebed (2019) argue that ICT media and resources can facilitate the mastery of science and technology materials and competencies needed today (Wahyuni & Yokhebed, 2019). Muzana et al. (2021) also report that information accessible through ICT media and resources is more extensive, thereby developing better insight. Furthermore, the use of non-ICT media and resources such as books and insectariums can also enhance students' conceptual understanding (Muzana, dkk., 2021). This aligns with Labib & Yolida (2019), who state that books presenting useful information can support learning references (Labib & Yolida, 2019). Imran & Suryani (2018) also added that insectariums, as media for preserving insects, can provide real experiences accompanied by unique and interesting information about insect morphology and classification. Thus, this can increase students' interest in the learning process (Imran & Suryani, 2018).

One of the problems faced by students when studying entomology is the difficulty in understanding insect morphology and classification, limited media, lack of variety in teaching methods, and lack of motivation to learn. Most students have difficulty understanding insect classification material. This is especially true when distinguishing insect orders based on complex morphological characteristics. These findings align with research conducted by Mech et al. (2022), which shows that insect classification material is difficult to understand without field experience or interactive visualization. As a result, students tend not to gain a deep conceptual understanding [8]. The research by Putri et al. (2024) also confirms that digital media such as image-based applications and interactive videos can enhance students' understanding of insect body structure and improve learning difficulties related to abstract material (Putri, et al., 2024).

In addition, limitations in the use of learning media in entomology lectures are one of the things that hinder the learning process. The students in this study stated that the use of conventional media such as PowerPoint slides and static images is ineffective in understanding insect characteristics. This situation is supported by the findings of Paradise and Bartkovich (2021), which indicate that the misuse of digital media based on citizen science, such as iNaturalist, can increase student participation in the process of independently identifying insect species, while also enhancing their understanding of biodiversity (Paradise & Bartkovich, 2021). Therefore, it is recommended to integrate interactive digital media into the entomology learning process as a potential effort to overcome the limitations of conventional media.

Various teaching methods are also an important focus in the results of this study. Students assessed that the learning methods applied by lecturers were not diverse enough and tended to be monotonous, resulting in them becoming passive during the learning process. This finding aligns with research conducted by Pratama and Hartati (2022), which demonstrated that the implementation of project-based learning methods and field activities can enhance students' active participation while improving their conceptual understanding of biology material. Therefore, innovative development of teaching methods

CONCLUSION

Based on the research conducted, it can be concluded that there are three main problems faced by students in learning Entomology. These problems are reviewed from the aspects of the content of the material taught, the learning methods/strategies applied, and the media/learning resources used. The issues identified include confusing

through a combination of field practicals, project-based learning, and interactive digital media is necessary to enhance the effectiveness of entomology lectures (Pratama & Hartati, 2022).

The lack of enthusiasm for learning among students was also identified in this study as one of the main factors hindering the learning process. Negative discourse about insects as a subject of research, as well as the view that entomology is irrelevant to the practical needs of students, also dampened their enthusiasm for learning. These results are consistent with research conducted by Miller and his colleagues. In 2025, a study found that through direct experience and active interaction with insects, students' attitudes can shift toward a more positive outlook, while also increasing their interest in entomology education. Therefore, it is important to integrate experiential learning in the field as an integral part of the entomology curriculum.

By comparing the results of this study with previous research, we can conclude that solving student learning problems in entomology lectures must include innovative digital learning media, experience-based teaching, and learning strategies that can increase students' intrinsic motivation. A shift in teaching approaches from conventional methods to more interactive, applied, and technology-based approaches is an urgent necessity to improve the quality of entomology education in higher education institutions.

material due to the large number of terms that must be mastered, non-interactive learning mechanisms, and limited use of engaging and relevant media and reference sources related to the topic being studied.

This study focuses solely on analyzing the problems of Entomology learning from the aspects of material, methods/strategies, and media/learning resources applied. Therefore, it is highly recommended for other researchers

to analyze the problems related to student learning outcomes in Entomology education. This is intended to complement this study and connect appropriate solutions to the problems that have been raised to improve specific student learning outcomes in Entomology education.

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