

THE ISSUE OF DIFFICULTIES FACED BY TWELFTH GRADE STUDENTS IN LEARNING CHEMISTRY ON THE SUBJECT OF ALKYNE DERIVATIVES

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Abstract

Learning difficulties refer to conditions when students face special obstacles in actively participating in the teaching and learning process, resulting in challenges in achieving optimal learning outcomes. One of the specific difficulties students' encounters is related to understanding the concepts of alkyne derivatives in chemistry. This research aims to explore the problematic difficulties faced by 12th grade students while learning about alkyne derivatives. The study adopts a qualitative approach and relies on a literature review, presenting descriptive findings. Data collection involves analyzing various sources, including scientific articles, theses, proceedings, and books that are relevant to the research focus. The study reveals that student learning difficulties are influenced by two major factors: internal and external. Internal factors include physiological aspects such as physiological conditions and the functioning of the five senses. Psychological factors also play a role, encompassing interests, intelligence, talent, motivation, and cognitive abilities. External factors, on the other hand, comprise social and natural environmental influences, as well as instrumental factors like the curriculum, programs, facilities, infrastructure, and the role of teachers.

Keywords: Alkyne Derivative Materials, Chemistry, Student Learning Difficulties

1. INTRODUCTION

Education plays a crucial role in the progress of a country. It is a method to enhance and develop the quality of human resources. According to Regulation No. 20 of 2003, Article 3, regarding the National Education System, the goal of national education is to nurture and develop the abilities of learners so that they become individuals who are devoted and pious to the One Almighty God, possess noble character, strong, capable, skillful, imaginative, independent, and become citizens who are chosen and visionary. The learning process can assist students in achieving these educational objectives. Learning is a series of efforts undertaken by an individual to achieve overall behavioral adjustment through their involvement and collaboration with their environment (Amaliyah et al., 2021).

Education is vital for human existence as it enables individuals to develop themselves, face changes and challenges with an open attitude and imaginative methodology without losing their character. The general goal of education is to enhance the nation's intelligence by making students more aware of what they are learning. In the

educational experience, educators provide learning materials to students with the aim of continuously improving their mastery. The reason for accumulating experiences is that learners become aware of the importance of data and information they acquire from trusted sources.

Every educational institution requires optimal educational experiences, both in terms of quality and quantity. However, in reality, not all school-based learning is optimal, and students often encounter learning difficulties and other challenges during the learning process. Learning difficulties refer to the condition when students face specific obstacles in actively participating in the learning experience and achieving ideal learning outcomes (Iswara et al., 2021).

Chemistry is one of the subjects that is less preferred by students. because it is considered to involve many abstract concepts to be learned (Ristiyani & Bahriah, 2016). One of the reasons for this situation is that in science, especially Chemistry, many dynamic aspects are considered, such as the concept of particles, oxidation numbers, reaction equations, energy, and hydrocarbon chains. as highlighted by Gabel, this complexity makes Chemistry a challenging example. It leads to various challenges for students, including difficulties in reading and understanding sentences or terms, struggles with numbers, and trouble comprehending ideas or concepts related to Chemistry, resulting in confusion, fatigue, and disinterest in learning it (Haris & Al Idrus, 2011).

Based on the above description, the problematic difficulties faced by 12th grade students in learning Chemistry on alkyne derivative material need to be explored to understand the reasons for the students' difficulties and the factors influencing their struggles in learning Chemistry, particularly regarding alkyne derivatives. This research aims to explore the problematic difficulties faced by 12th grade students while learning about alkyne derivatives.

2. RESEARCH METHOD

This research was a literature review. The discussion was described descriptively using a qualitative approach. The method of conducting literature research involved the activity of reading and recording the results of library data processing into research materials, as mentioned by Sari (2021). The reason for choosing a qualitative descriptive method was to provide an in-depth and clear description of the research findings, enabling readers to understand and interpret the studied research better. The procedure for sorting information was completed by comprehending and reviewing sources of information from articles/journals, proceedings, theses, and books that were relevant to the research topic. The gathered information was examined in stages, which included: (1) Reading and comprehending the entire review, extracting information applicable to this research. (2) Evaluating the research abstract to ensure it aligned with the research objectives. (3) Noting important points and incorporating them into the research materials, as well as recording the data sources in the bibliography.

3. RESULT AND DISCUSSION

3.1. Result

This research was conducted on July 17, 2023 and the topic of comparison from the literature review to be reviewed is the SMA Negeri 1 Percut Sei Tuan school to obtain learning outcomes in the field of chemistry, especially on the topic of Hydrocarbons: Alkyne Derivatives.

Table 1. Recapitulation of Data on Student Learning Difficulty Analysis Results

Aspects	Acquisition Score (%)
Number of students	36
Smallest score	52
Biggest score	80
Average	70
KKM (Minimum Completeness Criteria)	75

Source: Research Data

Based on Table 1, it can be seen that the average score obtained is 70, which falls under the moderate criteria (Anas, 2009). The highest score is 80, categorized as high (Anas, 2009), while the lowest score is 52, categorized as moderate (Anas, 2009). This indicates that the average class completion rate reaches 70%, meaning that 70% of the students have passed the topic of Alkyne Derivatives in the subject of Chemistry. Based on the data from 36 students, most of them experience learning difficulties in the moderate category.

Hydrocarbons are the simplest organic compounds, consisting only of carbon and hydrogen atoms. Based on the carbon chain structure, hydrocarbons can be divided into aliphatic, alicyclic, and aromatic compounds. Hydrocarbons with all single carbon-carbon bonds are called saturated hydrocarbons. If there is at least one double or triple carbon-carbon bond, they are classified as unsaturated hydrocarbons. A group of compounds with the same general formula and similar properties is called a homolog. Alkanes, alkenes, and alkynes have specific naming conventions. Alkynes are unsaturated hydrocarbons with one triple carbon-carbon bond. The general formula for alkynes is C_nH_{2n-2} (Riswiyanto, 2009).

Previous research has shown similar results that learning Chemistry, especially Alkyne Derivatives, is complex, requiring students to adjust hydrocarbon chains and name alkynes derivatives. This process can be very challenging for less careful or attentive students due to the need for precise naming of alkynes derivatives.

Teaching the topic of alkynes derivatives in Chemistry presents a significant challenge for teachers as the concepts are mostly abstract, involving memorization and imagination, even though they have contextual relevance in everyday life (Wulandari et al., 2018). Students need good thinking skills, analytical abilities, and strong memory to understand alkynes derivatives. To ensure that students achieve the expected learning competencies and that the teaching process is effective and efficient, a teaching model that enhances students' knowledge, attitudes, and skills is required (Dinatha, 2017).

3.2. Discussion

3.2.1. Learning Difficulties in Alkyne Derivatives Material

The reality that indicates the existence of difficulties in learning Chemistry provides an overview of the challenges faced in learning Chemistry. Data has been collected from past Chemistry test results, studies (undergraduate and postgraduate students), and other sources, all reflecting learning difficulties. The data includes quantitative information such as the level of students who successfully pass tests, average scores, as well as subjective information gathered from interviews and meetings with students who face learning challenges.

Students' obstacles include: 1) Difficulty in associating ideas; 2) The need to utilize logic and mathematical skills (not all students possess these skills simultaneously); 3) Requiring high determination to understand and overcome each problem; and 4) Observing a separation between theory and practice. Students with limited numerical-related abilities tend to lack interest in concentrating on learning Chemistry. Additionally, challenges are more prevalent in remote areas where most students do not meet the prerequisites for learning science, such as mathematics, logic, and language. It is important to recognize that Chemistry is not solely about mathematics; it encompasses other topics that are not purely numerical.

The causes of students experiencing difficulties in learning Chemistry include: lack of interest and attention during the learning process, unpreparedness to accept new concepts, insufficient emphasis on essential prerequisite concepts, shallow conceptual understanding, limited learning strategies, and a lack of varied exercise problems (Yakina *et al.*, 2017). Haris *et al.* (2019) found several factors leading to learning difficulties in Chemistry, including teachers' inadequate mastery of the subject matter, failure to use instructional media effectively, and a lack of implementation of various innovative learning methods that encourage student participation.

In essence, everyone has differences in terms of intellect, physical abilities, family background, learning habits, or approaches that can influence their ability to grasp lessons. Some find learning easy, some find it average, while others find it difficult. This can be seen from the grades or achievements they obtain. Students who have learning difficulties usually achieve less satisfactory grades compared to their peers (Syah, 2005).

This indicates that indeed some students face learning difficulties in Chemistry. Learning difficulties are a condition experienced by students characterized by specific obstacles that hinder the achievement of learning goals (Darminto, 2006). The phenomenon of a student's learning difficulties is usually evident from a decline in their academic performance or learning achievements. Additionally, learning difficulties can manifest through misbehavior, such as shouting in class, disturbing others, fighting, frequent absenteeism, or truancy.

Ristiyanı & Bahriah (2016) conducted research indicating that learning difficulties are caused by several factors, including: (1) External factors, which encompass environmental factors, both social and natural, and instrumental factors such as curriculum, programs, facilities, infrastructure, and teachers. (2) Internal factors, which include physiological aspects such as physiological conditions and the five senses, and psychological aspects such as interest, intelligence, talent, motivation, and cognitive abilities. This aligns with (Suryabrata, 1986), who states that factors affecting learning can originate from outside the student (extrinsic) and from within the student (intrinsic). Both factors interact, directly or indirectly, influencing students' achievements.

3.2.2. The Efforts to Minimize Students' Learning Difficulties

Meanwhile, Burton in Abin Syamsuddin identified students suspected of experiencing learning difficulties, indicated by their failure to achieve learning objectives. Students are considered to have failed in learning if: (1) Within a specific time frame, they do not achieve the minimum level of success or mastery in a particular subject as set by the teacher (criterion reference); (2) They are unable to perform or achieve their true potential, based on their level of ability, talent, or intelligence. Such students can be classified as underachievers; (3) They do not achieve the required level of mastery as a prerequisite for continuing to the next level of study. These students can be classified as slow learners or not yet mature (immature), requiring them to repeat the grade.

To identify learning difficulties and recognize students experiencing them, specific criteria are needed as benchmarks. With these criteria, the point where students are predicted to experience learning difficulties can be determined. Four measures can assess a student's learning failure or progress: (1) educational goals; (2) position within a group; (3) level of achievement compared to potential; and (4) personality. For effective studying of alkyne derivatives, four things should be done:

1. Reading the book before class
Read the reading material carefully before attending class. This strategy allows students to focus on what will be taught, understand the material taught at school, and identify what is currently in the book and what is not, making it easier for them to understand by taking notes. By reading the material to be studied earlier, students will pay more attention to the discussion.
2. Paying attention in class
Pay full attention during the learning process. The teacher can take several actions, such as checking previous assignments, reviewing students' notes, asking about unclear points, and addressing any confusion.
3. Taking notes
Take notes of essential points heard during the lesson. When reading the text, reduce writing, jot down unknowns, before class, after class, and even after leaving school. There is a tendency for poor note-taking, where anything the educator says is simply recorded. While taking notes, students may keep writing without attempting to understand what the educator is conveying in the discussion. Learners should aim to comprehend the message conveyed by the teacher. When students need to use the notes, they wrote to study and solve problems, they should fully understand their notes. The approach should involve more thinking and less writing, using books to reinforce thinking. There are alternative note-taking approaches, some focusing on important parts, while others add small notes.
4. Solving Problems
Work on problems, repeat them. Work on many problems. Work on a task until it is fully understood. Problems will ask students to apply the learning materials and concepts provided by the teacher. Problems will help students identify which concepts and ideas are clear and which are not yet clear.

4. CONCLUSION

Based on the presentation of the research results and discussions above, it can be concluded that there are two factors influencing student learning difficulties in learning chemistry on alkyne derivatives: (1) external factors (outside), which include environmental factors such as social and natural factors, as well as instrumental factors such as curriculum, programs, facilities, infrastructure, and teachers; (2) internal factors (inside), which encompass physiological aspects like physiological conditions and the five senses, and psychological aspects including interest, intelligence, talent, motivation, and cognitive abilities. The number of problems related to student learning difficulties in understanding alkyne derivative material can be minimized by implementing four strategies: reading books before entering class, paying attention during lessons, taking notes, and practicing problem-solving.

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