

An Analysis of Obstacles to the Science Education Process

Cindy Dwi Kartini¹, Ika Chastanti^{1*}, Dahrul Aman Harahap²

¹ Pendidikan Biologi, FKIP Universitas Labuhanbatu Sumatera Utara Indonesia.

² Peternakan Fakultas Pertanian Institut Teknologi Dan Sains Paluta Indonesia.

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Abstract: Numerous obstacles might arise throughout the process of science education. The obstacles in the science education process include a lack of concentration on the part of the students, a lack of understanding of the material, and the use of learning media. The aim of this study is to identify the obstacles on science education at the Private Vocational School of Al-Washliyah Silangkitang. Purposive sampling is used in this study. The researcher selects samples in accordance with the research goals, with the expectation that they address the researcher's concerns. The data analysis strategy was qualitative descriptive, utilizing the Miles and Huberman model. The results showed that the obstacles experienced during the science education learning process based on the highest percentage were indicators of the use of learning media by 69% and the students do not comprehend the teacher's information at 66.70%. The lowest percentage in the category of the students are uninterested is 65.30% and students have difficulty concentrating in learning at 62.10%. In general, the results obtained from the questionnaire data show that the students' obstacles during the science education process have been on average 65.78%. Teachers and students stated that the difficulty in understanding science material was due to the lack of textbooks or handbooks. As a result, it requires an engaging learning environment and the availability of science textbooks

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Introduction

Education is a process which could provide a person experience, as well as the information and skills necessary to live a better life. These three things can be embraced by the curiosity that emerges inside a person, resulting in a desire to accomplish something that contributes to a greater comprehension of everything that exists in nature (Arifin et al., 2017). According to Mahfud, (2016) Training is fundamental in one's life, and it is also a critical element of the state and government.

The educational system serves a unique role in facilitating the learning process. Teachers are not only expected to master the subject matter, but also to master the necessary skills. Students must be able to perform something, which requires mastery of

scientific methods and concepts (Masruri, 2020). According to Warsah & Nuzuar, (2018) that Before engaging in classroom teaching practice, the teacher must be able to plan a lesson in advance.

Science education is a subject with a field of study that embeds the fundamental concepts of various natural sciences. These concepts are compiled through an educational approach and psychological considerations, and are critical in the lives of all students at the elementary, junior high, and vocational levels in order to equip and prepare students for further education in superior level (Yulianti et al., 2015). According to Hamdu & Agustina, (2011), Natural Sciences (IPA) is one of the educational disciplines that may give students with roles and experiences. Science education results are also impacted by students' motivation, both internal and external. Science

*Email: Chastanti.ika@gmail.com

education is accomplished through a variety of strategies, most notably by increasing learning motivation. In terms of student learning, students will succeed if they possess a willingness to learn and a desire or drive to learn, because an increase in learning motivation will motivate students to change their attitudes and behaviors toward learning study.

According to the Ministry of Education and Culture regulation of reversing the ratio of senior high school to vocational high school from 30% to 70% in 2014. Vocational high school graduates are expected to be competitive in an era of globalization and free markets, owing to the skills and talents developed by vocational high school students. Processing and preparing them for usage in order to compete (Hayati et al., 2013).

Learning is at the foundation of an educational institution's instructional process. Learning is defined as a change in one's knowledge, skills, and attitudes (Dadri et al., 2019). According to Malawi & Tristiar, (2016) When learning objectives are met, the learning process is deemed effective; nevertheless, the success or failure of reaching learning objectives is contingent upon the manner in which students learn.

According to Safira et al., (2020), The teacher's learning process has a significant impact on the success of science education in vocational high schools; therefore, the teacher is guided to make the material as attractive as possible in order for students to be engaged and not bored during the learning process; additionally, the teacher's learning process must achieve the goal of optimal learning and learning outcomes. If a learning environment is to function ideally, the teacher must employ innovative and diversified methods, media, and learning.

Teachers and students are the primary components of the science education process; yet, teachers and students encounter obstacles during the science education process. Teachers and students face a hurdle in the form of a shortage of facilities and infrastructure. Critical role of facilities and infrastructure in supporting learning can lead in less than optimal learning, as seen by the lack of libraries and laboratories (Robikhah & Nurmawati, 2021).

The primary impediment to learning is the teacher, as the teacher is a core part in learning. Throughout the learning process, the teacher will present students with an overview of the topic. If the manner of teaching is not appropriate for the student's situation, learning will be passive, and the student-centered learning principle will not be implemented (Mahardika, 2013).

Apart from the obstacles faced by the teachers in selecting learning techniques and models that are inappropriate for the students, namely the students' personal situation, the teacher is required to encourage students to participate actively in the learning process.

According to Hamdu & Agustina, (2011) Essentially, encouragement is the deliberate effort to move, to direct and sustain a person's behavior in order to inspire him to take action in order to reach a certain outcome or objective. According to Kusuma et al., (2017), A student's less than ideal knowledge can operate as an impediment to learning, making it difficult for students to comprehend the information being taught, which has a negative effect on student enthusiasm for receiving lessons.

The aim of science education is to provide students with a broad understanding and insight into fundamental concepts of nature, knowledge about humans and the environment, as well as sensitivity and awareness toward nature and the environment, in order to develop into responsible members of society and citizens. This objective is attainable if the scientific education curriculum in schools is well-organized (Priyatma et al., 2019). According to Nahdi et al., (2018) Science education attempts to aid the students in comprehending scientific ideas relating to natural occurrences and might instill scientific attitudes in them. Because science education is capable of genuinely activating students in mastering topics and enabling them to use their knowledge in everyday life, the impact of instructors is critical in learning. Teachers must be able to give learning opportunities that directly involve the students. However, when the learning process occurs, a great deal of learning occurs monotonously, when lesson is solely directed by the teacher and proceeds in one direction without involving the students directly, which might result in inactive learning.

In an effort to overcome the problem of learning science at the Private Vocational School of Al-Washliyah Silangkitang, it is necessary to conduct research on an analysis on obstacles to the science education process at the private vocational school of al-washliyah silangkitang. The aim of this study is to identify the obstacles on science education at the Private Vocational School of Al-Washliyah Silangkitang. By knowing the types of learning obstacles experienced by students and the factors that influence them, the teacher can provide solutions according to the problems faced by students.

Method

This study employs a descriptive qualitative research approach with the aim of providing an analysis of the obstacles on the science education learning process at the Al-Washliyah Silangkitang Private Vocational School. Qualitative research is a naturalistic research method because the research is carried out in natural conditions (natural setting) (Sugiyono, 2014).

The objects in this study were the science teacher of Al-Washliyah Silangkitang Private Vocational High School and students of class X TKJ (computer and network technology) and X TBSM (motorcycle business techniques) with 36 respondents. The study used a descriptive qualitative research approach using purposive sampling technique. In this technique, the researcher determines the sampling method according to the research objectives, so that it is expected to be able to answer the researcher's problems.

The data analysis technique was carried out in a qualitative descriptive manner using the Miles damn Huberman model. This model is carried out in 3 stages: (1) data reduction, namely a) summarizing direct contact data with people, events and situations at the research site, b) coding, c) making objective notes, d) making reflective notes, e) making marginal notes, f) storing data, g) making memos, h) analysis between locations, and i) making temporary summaries between locations. (2) Display data by compiling narrative text. (3) Verification is the stage of drawing conclusions (Chastanti et al., 2019).

Result and Discussion

Based on the results of research that has been carried out by researchers regarding the analysis of the obstacles of the science education learning process at the Al-Washliyah Silangkitang Private Vocational School, that the steps in analyzing data are by calculating the scores obtained in the form of percentages after that analyzing research data using percentage analysis. The results of the calculations in the form of percentages are entered into the criteria table for the level of obstacles, then interpreted with qualitative sentences.

Table 1. Criteria for the level of obstacles in the science education learning process.

Score	Interval (%)	Criteria
73-96	100.00	Very high
49-72	75.00	High
24-48	50.00	Low

Research on the obstacles of the science education learning process using questionnaires and interviews, it can be found several aspects of the obstacles experienced during the science education learning process at the Private Vocational School of Al-Washliyah Silangkitang. Some indicators of problems in the learning process in the form of lack of concentration in student learning, understanding of the material, and the use of learning media as well as the emergence of boredom in learning. Obstacles in learning science are divided into 4 factors, namely as follows.

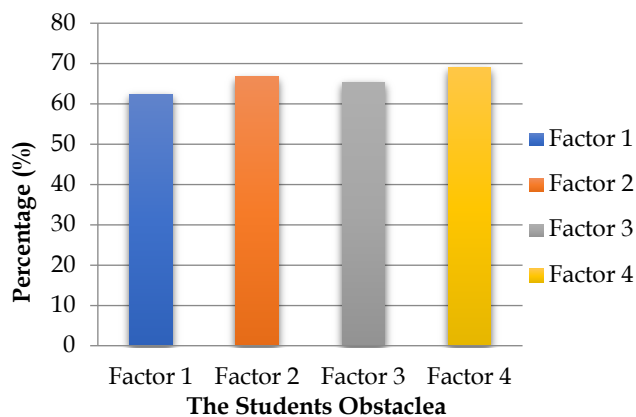


Figure 1. The students' obstacles in the science education learning process are depicted in.

The results of the data collected through a questionnaire meant to determine student answers to obstacles faced during science education learning. As a result, questionnaires were sent to 36 students in classes X TKJ (computer and network technology) and X TBSM (motorcycle business engineering). The questionnaire has four indicators and is reduced to 24 statements completed by respondents with the intention of eliciting a description of the barriers encountered by respondents during the scientific learning process, as supporters, and the data collected and evaluated. Interviews were also undertaken to supplement the data collected via the questionnaire. Interviews with the tenth-grade teacher at the Private Vocational High School of Al-Washliyah Silangkitang were conducted to analyze the obstacles on the science education learning process, and the interviews revealed attempts to resolve the obstacles faced.

Based on the results of the bar chart above, it shows that the highest percentage is found in indicators of the use of learning media by 69% and the students do not comprehend the teacher's information at 66.70%. The lowest percentage in the category of the students are uninterested is 65.30% and the students have difficulty concentrating on their lessons at 62.10%. In general, the results obtained from the questionnaire data show that students' obstacles during the science education learning process have so far been with an average of 65.78%.

The students have difficulty concentrating on their lessons

Concentration of learning is a focus on the process of changing behavior as expressed through mastery, use, and evaluation or on attitudes and behavior values, fundamental knowledge and skills contained in each field of study. Theoretically, if students' attention is not concentrated, low-quality activities might well result, as will disinterest in learning (Aviana & Hidayah, 2015).

The data acquired demonstrates that the hurdles in the standard of the students who have difficulty with concentration are impediments to the science education learning process, with a percentage of 62.10%. When the students are engaged in learning activities, they frequently encounter branching thoughts. Without realizing it, branched ideas might emerge. As a result, the students become distressed when they are unable to concentrate on their studies. This becomes a hindrance to the students' learning because when the students exhibit a negative attitude, their attention is impaired, preventing them from fully absorbing knowledge (Robikhah & Nurmawati, 2021).

The inability of the students to maintain concentration long enough to respond to teachings is tied to the teacher's teaching methods and the classroom learning environment. This is because, among other reasons, the teachers are less capable of increasing each student's excitement for active learning through the employment of ineffective teaching approaches. Additionally, the class mood owing to heated classroom circumstances, hunger, and drowsiness contributes to the loss in focus throughout the lecture. Due to the lack of air conditioning in the classroom, students become hot and frequently fan during the teacher's explanation of the material, and hunger and sleepiness also contribute to students' lack of attention to the teacher's explanation of the material, which creates difficulties in the learning process by reducing students' understanding of the material presented by the teacher at school. According to Bayanah, (2019) Class atmosphere refers to the atmosphere or circumstance that exists in a classroom throughout the learning process, and a positive classroom atmosphere encourages students to engage actively in the teaching and learning process.

According to the results of the teacher's interviews, the teacher's efforts to increase student concentration in learning, namely the teacher has carried out maximum learning through the use of learning strategies and methods, and the teacher is constantly improving his or her method of teaching and how to master the class in order to attract students' attention and keep them comfortable and focused during lessons. According to Arianti, (2019) To stimulate the students' interest in learning, the teacher should employ a variety of teaching and learning strategies and consider in reference period and breaks.

The teacher should possess unique ability to master the content through the use of a variety of tactics and approaches, as well as to master the class throughout the learning process in order to create a pleasant learning environment that does not disrupt students' concentration while they study.

The students do not comprehend the teacher's information

The issue of the students not understanding the material presented by the teacher was reinforced by the results of interviews, which revealed that the teacher chose the method of discussion, lecture, and question and answer because it was simple to implement despite the school's lack of facilities and infrastructure, making it the most frequently used method by teachers. This is also demonstrated by the results of the presentation of the students who do not comprehend the information delivered by the teacher, scoring 66.70%.

A lesson can be considered effective if the students comprehend and master the subject presented by the teacher. One of the teacher's responsibilities is to ensure that the students master and comprehend the information the teacher has taught. According to Nurlaila, (2021), A teacher's professionalism, knowledge, attitude, and skill in the learning process are all essential. Additionally, an educator must grasp suitable learning theories, learning models, and teaching and learning practices for their areas.

According to Permana et al., (2016), There are several things that teachers may do as critical position holders to make learning more meaningful; specifically, they must be able to provide effective, diversified, and enjoyable learning experiences that are intended to maximize learning outcomes. To ensure that students do not encounter difficulties while the instructor is delivering the content, the Private Vocational School of Al-Washliyah Silangkitang offers Science education as one of its disciplines.

According to the study by Prabandari and Mulyadi, (2019), Throughout the teaching process, the teacher maintains a concentration on the teacher's method. One of them is in science courses, where students are less engaged when confronted with science issues and only a few pupils dare to speak out in front of the class. This demonstrates that the instructor is more dominating in the learning process by employing the lecture style and omitting opportunities for students to share their ideas. This might result in learning issues for students. Additionally, teachers do not employ supporting media that might help explain the topic and make it simpler for pupils to comprehend it. Students may struggle to study science if they lack a variety of approaches and media.

Efforts in this handling are in the form of providing varied learning methods, utilizing the facilities and infrastructure that have been provided optimally and providing a sense of concern for the students.

The students are uninterested

The data acquired demonstrates that the difficulties in the standard of students feeling

uninterested are impediments to the science education learning process, as the proportion of students experiencing boredom is 65.30%. When learning occurs in the classroom, the instructor conducts it in a repetitive manner, resulting in a lack of utility in science education learning, uninterested, and low student learning outcomes. According to Detri et al., (2018), The weak component of student learning outcomes is also impacted by low knowledge of science topics and a lack of engagement among students, which results in unproductive conversations, which causes some students to become inactive and bored during science education learning.

Circumstances that can contribute to students experiencing boredom while learning include long study hours each day, a large number of subjects, and a high probability of being accepted by students' memories. These factors can cause the learning process to reach the student's ability obstacles due to feeling uninterested and fatigue. weariness) that might result in pupils being bored. The students' exhaustion can result in boredom, and students lose motivation and become unmotivated to continue with the following class (Ambarwati, 2016).

According to Kurnia, (2021) ,Two critical components of education are motivating and reinforcing the students. The teacher's role as an educator who is there each day is to provide time for small conversation as an opener in learning so that the students not only absorb the subject matter but also gain inspiration and reinforcement from the teacher. It is critical to provide motivation and reinforcement so that students feel comfortable and enthused about the learning process.

For a teacher, it is critical to understand the students' mental state and whether they are bored during class. By identifying the sources of the students' monotony, teachers may more simply determine the necessary strategies to take to address the issue of student boredom. Thus, teachers must give motivation, reinforcement, and tactics for learning in order to help the students avoid boredom through the use of engaging and varied learning strategies and methods.

The use of learning media

Obstacles can be seen from the aspect of using learning media with the highest percentage value of 69%. From the results of the interview, it was found that the teacher chose learning media in the form of tools used to support the implementation of the teaching and learning process, ranging from books to the use of electronic devices such as cellphones. Most students want to learn with interesting media so that it is not monotonous and boring. Based on the results of the research presented, it is in accordance with the theory stated by Mahnun, (2012) that the media is a

means of distributing messages or learning information to be conveyed by the teacher to the target or recipient of the message, namely students.

Everything that can be utilized to facilitate someone's learning activities is considered learning media. Media, newspapers, magazines, package books, learning aids, television, and the internet are all examples of learning media. The absence of books in the school library and a difficult-to-access internet network impedes the learning process.

Due to a shortage of tools and materials in schools, pupils' learning resources remain constrained. The teacher expressed dissatisfaction with the handbooks used by students, stating that students lacked a biology textbook due to the library's scarcity of handbooks. Students desire equipment for science package books in the library. The library serves as a repository for books and other required educational supplies (Puspitasari, 2016).

After interviewing the teacher, it was determined that the most inhibiting learning media factor in the science education learning process was the teacher's inability to convey material due to the lack of necessary facilities such as laboratories and tools and materials such as textbooks, forcing teachers to use internet-based materials to teach. The majority of students desire engaging media and the availability of textbooks to ensure that the learning process is not monotonous.

Success in learning is determined by a variety of factors, including: attempts to include media into learning activities as sources of information, and the process of incorporating media into learning activities is a decision made by the teacher based on learning designs (Miftah, 2014).

To overcome this obstacle, the teacher must be able to consider the media's usability and accessibility. If a teacher is unable to access a media for whatever reason, he or she should seek out and develop alternates, such as creating a media using the capabilities available. And, as a teacher, it is critical to include media into learning activities, not just books, but also newspapers, magazines, learning aids, and power presentations, to engage students in the learning process.

Conclusion

Based on the results of the analysis and discussion, it can be concluded that the most important constraint factor in the science education learning process is the use of learning media with the highest percentage of 69% and the students do not comprehend the teacher's information at 66.70%. In this aspect, there is a lack of learning media used by teachers in the science education learning process, because the facilities needed do not exist such as laboratories and the lack of

tools and materials such as textbooks so that teachers have to use improvised materials and teachers only teach by lecture and question and answer methods, causing students to do not understand the material presented by the teacher. In this case, teachers and students want the availability of textbooks and students want teachers to use interesting learning methods and media.

The lowest percentage in the category of the students are uninterested is 65.30% and students have difficulty concentrating in learning at 62.10%. The students endure boredom and difficulties concentrating throughout the learning process as a result of ineffective teaching techniques and instructors who are unable to pique each student's interest for active participation in learning. Additionally, focus and boredom decrease throughout the learning process as a result of the heated classroom environment, hunger, and tiredness. In this instance, it is critical for the instructor to understand the pupils' state of mind, including if they are bored or have lost attention throughout the learning process. Thus, teachers must employ tactics in learning to help pupils overcome boredom and low focus through the use of engaging and varied learning ideas and approaches.

In summary, the results of the questionnaire indicate that students encountered an average of 65.78% of obstacles during the science education learning process.

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