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ANALYSIS OF SCIENCE MISCONCEPTIONS IN GRADE V UPT SD NEGERI 16 GRESIK

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Abstract

This study aims to identify the location and factors that cause science misconceptions experienced by students. By using a qualitative approach. The data collection techniques used were observation, interviews and documentation. This study involved 20 fifth grade students at UPT SD Negeri 16 Gresik in the 2024/2025 school year who had learned photosynthesis material, digestive system, force and motion. The results showed that there were 30% of participants experiencing misconceptions in photosynthesis material, 16.5% of students experienced misconceptions in digestive system material and in force and motion material, 11% of students experienced misconceptions. The factors that cause misconceptions experienced by students are caused by internal and external factors. Internal factors such as students' lack of thinking ability, low motivation of students during learning, students' lack of understanding of the material and lack of confidence. External factors such as methods used during learning and limited learning resources. Based on this research it is recommended that teachers emphasize things that are demonstrations, concrete examples and discussions on photosynthesis material, digestive system, force and motion so that students can think more critically and actively in class learning activities. Teachers can also provide different learning models and prepare interactive learning media. Schools must provide habituation to reading books in the library. In addition, research related to science misconceptions in other materials is highly expected to be carried out, because to identify misconceptions, develop effective learning strategies and increase teacher awareness. This shows that, although students have learned these materials in class, misconceptions still occur.

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Keywords: Science Misconceptions, Photosynthesis, Digestive System, Force and Motion.

INTRODUCTION

Learning is a teaching and learning activity from a teacher to students, in which there are teaching materials as support. Learning is a process that a person experiences from the mother's cradle to the grave. In learning there are several processes and stages starting with learning from the family environment to the social environment (Ika et al., 2023). The learning process in general, students have basic knowledge about the lessons they will learn (Faizah, 2016). This forms an experience and creates a learner's theory about the events he is experiencing so that it forms the concept of learning in class.

Information processing in learners sometimes does not happen properly. There is a difference in understanding that occurs in students with concepts that scientists believe. The role of the teacher is considered very important because, the teacher is the first person who can communicate book concepts in two directions with students (Zakiah Dewi & Tatang Ibrahim, 2019). Often learners understand concepts after school learning and the learning framework deviates from the actual concept. The deviant learners' conceptual framework can be called misconceptions (Ngurah & Laksana, 2016).

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Misconception is an error in understanding a concept, lack of understanding of the concept and inaccurate in giving examples of a concept (Subayani & Nugroho, 2018). This happens a lot in science learning (Yuliati, 2017). Science learning is a delivery process that teaches students to learn about themselves and the surrounding nature (Ngurah & Laksana, 2016). At the same time, science learning itself is a very important subject, because in this subject students learn science in solving a problem.

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Students experience misconceptions because they find things that do not match the science concepts learned in class with their daily life experiences (Yuliati, 2017). Some of the results of misconception research on photosynthesis material, digestive system, force and motion show that, in photosynthesis material, students think that photosynthesis occurs only during the day because of sunlight. While at night photosynthesis can occur because of the help of light. Furthermore, in the digestive system, students assume that the function of the liver in the digestive system is to neutralize toxins. The correct answer is that the function of the liver is to create bile which is carried to the duodenum to help the process of breaking down fat into small fat grains. In force and motion, students assume that all forces are the same but forces have different properties, magnitude, direction of force and type of force. From these experiences, learners' theories are formed from their own thinking. The concept of students' thinking is the same as the concept owned by scientists but in a simple form and cannot be said to be wrong, but if the concept of students deviates it can be called "Misconception" (Faizah, 2016). This shows that science misconceptions still occur.

Research (Dwilestari & Desstya, 2022) on photosynthesis material students experience misconceptions. The results showed that 31.84% of students had misconceptions about the materials produced by photosynthesis, 16.16% of students had misconceptions that photosynthesis requires light, 80.83% of students had misconceptions about the products produced during photosynthesis, 54.53% of students had misconceptions about where photosynthesis occurred and students had misconceptions about the time of photosynthesis as much as 25.38%.

In research (Indrajatun & Desstya, 2022) on the material of the digestive system, students experience misconceptions. The results showed that 52.78% of students had misconceptions about the glands of human digestive organs and glands, 55.56% of students had misconceptions about the functions of digestive organs and human digestive glands, 50.00% of students had misconceptions about the human digestive process, and 47.22% of students had misconceptions about the kinds of diseases that exist in human digestive organs.

In research (Nasution et al., 2021a) on force and motion material as many as 61.41% of students experience misconceptions. The results showed that 38% of students had misconceptions about the meaning of force, 64% of students had misconceptions that force could change the shape and size of objects, 72% of students had misconceptions that force could change the motion of objects, 52% of students had misconceptions about the meaning of gravitational force, and 70% of students had misconceptions about the direction of gravitational force towards the center of the earth.

The objectives of this study are 1) Describe science misconceptions that occur in students in grade v elementary schools on photosynthesis material, digestive system and force and motion. 2) Describe the factors that cause misconceptions in grade v students in elementary schools.

METHODS

This research uses a qualitative method approach, including the initial stage, the implementation stage and the final stage. Data collection involved 20 students from UPT SD Negeri 16 Gresik. Data collection techniques using interviews, observation and documentation methods.

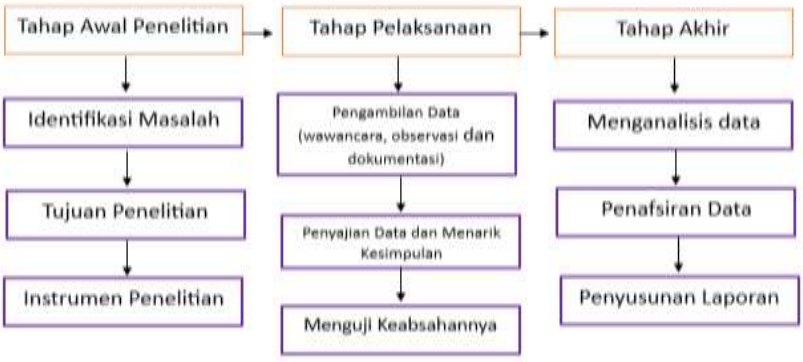

Figure 1.1 Steps of qualitative methods

In data collection there are two stages. The initial stage of research includes problem identification, research objectives and research instruments. The implementation stage is the stage of data collection in the form of interviews, observation and documentation, data presentation and conclusions and testing its validity. The last stage includes analyzing data, interpreting data and preparing reports.

Interviews were used to strengthen and confirm the misconception observation data obtained. Interviews were conducted with science teachers and grade v students who had taken photosynthesis, digestive system, force and motion. This interview session aims to identify and understand the causes of misconceptions in students, increase teacher awareness of misconceptions experienced by students and improve the quality of learning and the education system in students. Observation to obtain accurate and reliable information, such as places, actors or subjects, objects, activities, events. While documentation is used as a complement. In interviews in the form of question and answer questions to students as many as 29 questions and interviews to class teachers as many as 27 questions. In observation, researchers observe several things such as when learning begins, environmental observation, observation of teaching materials and observation of class teachers or subject teachers. Documentation in the form of recordings during interviews, documentation of the learning environment, class and during interviews with teachers and students.

The research interview guideline uses unstructured guidelines, because it only contains in the line of questions asked. In this study conducted interviews with teachers and students, to be able to analyze and know more about the misconceptions that occur in students. The interview grids are as follows:

Table. 1 Grid of Interview Guidelines

Aspects	Indicator	Source
Science misconceptions	Analyze the concept of photosynthesis	Learners
	Analyze the concept of the digestive system	Learners
	Analyze the concept of force and motion	Learners
Learners' motivation when participating in learning	Factors that influence learner motivation.	Teacher
	Learners' attitude in receiving science materials	Teacher
	Learners' interest in learning.	Teacher
	Obstacles in receiving material during learning.	Teacher
	Benefits of science materials for learners.	Teacher
Causes of misconceptions in science learning	Teacher's ability to communicate in the classroom.	Teacher
	Teaching materials used during learning.	Teacher

RESULTS AND DISCUSSION

In the results of this study in the form of interviews, observation and documentation. The following are the results of interviews with subject teachers and students.

a. Misconceptions in Learners

The magnitude of misconceptions that are getting higher can indicate a lack of literacy skills, literacy in the 21st century is needed, one of which is to use scientific information in making decisions and arguing (Subayani & Nugroho, 2018). The large percentage of misconceptions experienced by students also hinders concept understanding and affects learning motivation. Students experience misconceptions with the highest percentage in photosynthesis material, which is 80%, then in the digestive system material as much as 45% and in force and motion material there are 35%.

Table 2. Grid of Interview Guidelines

Misconceptions		
Photosynthesis	**Digestive System**	**Force and Motion**
At night plants undergo photosynthesis. a. Plants only photosynthesize in the morning and afternoon. b. Plants do not photosynthesize at night. c. The sun is only available in the morning and during the day. So plants cannot photosynthesize at night.	The liver is not related to the digestive system. a. The heart is only for feelings. b. The liver is used for breathing. c. The liver has nothing to do with the digestive system. Because the liver is not part of the digestive system	When a car is moving and the brakes are applied, does the force affect the shape of the object? a. When stepping on the brakes of a car. The car brakes will be dull and cause the car brakes to break, thus affecting the shape of the object. b. Brakes that are attracted using magnetic force. c. When applying the brakes, it can change the shape of the car.

In photosynthesis material, students still think that at night plants do not photosynthesize. The following is a conversation between researchers and 5th grade students:

Researcher's conversation with Grade 5 learner I during the photosynthesis interview that had the most misconceptions

Researcher : "At night, do plants photosynthesize or not?"

Student : "No"

Researcher : "Why ?"

Student : "Because at night there is no sun"

The researcher's conversation with Grade 5 learner II during the photosynthesis interview had the most misconceptions.

Researcher : "At night, do plants photosynthesize or not?"

Student : "No"

Researcher : "Why ?"

Student : "Plants do not photosynthesize at night"

Conversation between researcher and learner I grade 5 during the interview of the digestive system that has the most misconceptions.

Researcher : "The liver is not releated to the digestive system"

Student : "No related "

Researcher : "Why is it not realeted?"

Student : "Because the heart is for expressing feelings"

Researcher : "The heart is just what ??"

Student : "The heart controls feelings like sadness, anger, and happiness"

The researcher's conversation with Grade 5 learner II during the interview of the digestive system had the most misconceptions.

Researcher : "Why is the liver not related to the digestive system"

Student : "No "

Researcher : "Why not?"

Student : "Because that's right, the liver is not part of the digestive system"

Researcher : "What is the digestive system?"

Student : "Digestion is the intestine, colon, small intestine, small intestine and anus"

Researcher : "What is the small intestine?"

Student : "Eh, it's a small intestine anyway"

Researcher conversation with Grade 5 learner I during the force and motion interview.

Researcher : "When a car is moving and the brakes are stepped on, does the force affect the shape of the object, yes or no?"

Student : "Yes, because when you step on the brake, the brake lever will decrease and change the shape of the object"

The researcher's conversation with Grade 5 II students during the interview on force and motion had the most misconceptions.

Researcher : "When a car is moving and the brakes are applied, does this force affect the shape of the object or not?"

Student : "Yes, because the force being pulled shows the magnetic force"

b. Science Teacher Interview

Interviews with science teachers were conducted by class teachers, because in UPT SD Negeri 16 Gresik there are no special subject teachers and there are only class teachers. This interview asked how important science learning is in elementary schools, what media is used during learning, what methods are used. The enthusiasm of students when receiving learning when photosynthesis, digestive system, force and motion material is also presented by the teacher in the interview session. The teacher explained that when students received the material, they were very enthusiastic and happy. The learning method provided is PBL (Problem Base Learning).

The media used by teachers during learning for photosynthesis is field practice to directly observe the process of photosynthesis accompanied by videos. The media used by teachers for the digestive system are videos and pictures of the digestive system. As for force and motion, the teacher does not use media but directly practices it.

Teachers learn and understand the material on photosynthesis, digestive system, force and motion taught from teacher handbooks, websites and the environment. According to the teacher, the textbook provided by the school is appropriate and appropriate and refers to the learning outcomes. If the learning outcomes have been achieved then the learning is in accordance with the description. For teaching materials, according to the teacher, it is well packaged and will be developed again.

Things experienced by students when experiencing misconceptions such as difficulty digesting learning, lack of understanding of students in absorbing material and the number of foreign languages contained in textbooks. The way teachers respond to students who experience misconceptions is to provide reflection, reinforcement at the end of learning and provide evaluation in order to minimize students experiencing misconceptions.

The way teachers motivate students who experience misconceptions is by providing more experience, providing encouragement. To increase the motivation of students when experiencing misconceptions is by using other methods and more interesting methods. Factors that cause students to experience misconceptions from children's understanding, the environment and how children absorb the material. The way teachers overcome students' misconceptions, namely instilling a maximum understanding of the material being taught.

c. Learner Interview

Interviews were conducted in this study to complement information related to data obtained during observation. The number of students interviewed was 20 people as representatives. The number of interviews with students in photosynthesis material was 10 interview questions, 10 interview questions in digestive system material and 9 questions in force and motion material so the total interview questions totaled 29 questions. In the answers to students' interviews, researchers conducted mapping in order to find out students' understanding of photosynthesis, digestive system, force and motion material.

Table 3. Misconception Classification

First Level	Second Level	Third Level	Category
Correct	Correct	Sure	PK
Correct	Wrong	Sure	MCC
Wrong	Correct	Sure	MCC
Wrong	Wrong	Sure	MS
Wrong	Wrong	Not Sure	KP

Description: 1.PK: Understand the Concept, 2: Partially Understand the Concept, 3: Misconception, 4: Lack of Knowledge (Syuhendri et al., 2019).

In the answers of students categorized as PK (Concept Understanding), it shows if students answer questions based on scientific concepts, PKS (Partial Concept Understanding) students show if they understand the concept only partially, MS (Misconception) students show experiencing misconceptions, KP (Lack of Knowledge) students show if they do not understand the concept.

The results of interviews with students in photosynthesis material there are many students understand the concept of the material as much as 19.5%. The number of students who partially understand the concept of photosynthesis material is 13.5%. 30% of students who experience misconceptions and as many as 47% of students do not understand the concept. In the digestive system material, 14% of learners understand the concept. While as many as 12.5% of learners understand some of the concepts of the material. Learners who experience misconceptions in digestive system material are 16.5% and students who do not understand the concept are 57%. In the material of force and motion, 27.5% of learners understand the concept. As many as 9% of learners understand some concepts. While 11% of students experienced misconceptions and as many as 43.5% of students did not understand the concept on the material of force and motion.

DATA ANALYSIS

Analysis of student interview data has been tested for validity. In the previous sub chapter, there are answers to the analysis of student interviews that can be described as the percentage of misconceptions experienced by students contained in the following table.

Tabel 4. Percentage of Misconceptions in Students on Photosynthesis Material

No Question	Interview Questions	Percentage %			
		PK	**MCC**	**MS**	**KP**
1.	The location of chlorophyll in plants is only located in the leaves	5%	15%	25%	55%
2.	The process of photosynthesis in plants only requires sunlight.	25%	25%	35%	15%
3.	Plants that have leaves that are colored other than green do not photosynthesize	30%	10%	20%	40%
4.	Glucose (C_6 H 12 O_6) is the result of photosynthesis.	5%	0%	5%	95%
5.	The function of light in photosynthesis is to increase the energy sources needed by plants.	40%	20%	0%	40%
6.	CO_2 is the gas released during photosynthesis	35%	0%	20%	45%
7.	Learners assume that photosynthesis only occurs in the morning and afternoon.	0%	5%	80%	15%
8.	Plants experience photosynthesis only during the day.	0%	10%	75%	15%
9.	Converting CO_2 into O_2 is a function of chlorophyll.	5%	20%	10%	65%
	Water, carbon dioxide, chlorophyll and sunlight can affect photosynthesis in plants.	50%	0%	0%	50%
	Total	**22%**	**11%**	**30%**	**48%**
	Average	**20%**	**10%**	**27,27%**	**43,63%**

Description: 1.PK: Understand the Concept, 2: Partially Understand the Concept, 3: Misconception, 4: Lack of Knowledge (Syuhendri et al., 2019).

a) Misconception Analysis of Problem Number 1

As many as 25% of students experience misconceptions and assume that chlorophyll is only located in the leaves and as a dye. The answer should be if chlorophyll is not only located in the leaves but also located in the plant stem (Yunia et al., 2019). The reason is that although chlorophyll is most commonly found in leaves, chlorophyll is also found in other parts that contain photosynthetic cells. Such as stems in plants, especially plants that have green stems. Chlorophyll itself is the most important pigment for photosynthesis.

b) Misconception Analysis of Problem Number 2

As many as 35% of students experienced misconceptions in interview question number two. Learners assume that when photosynthesizing plants only need sunlight because plants photosynthesize during the daytime only. The answer should be if during the photosynthesis process plants not only need sunlight but also need water, carbon dioxide (CO_2) and chlorophyll (Roosyanti, 2017). The function of sunlight during photosynthesis is used to trigger chemical reactions in photosynthesis. The light will be absorbed by chlorophyll and other substances contained in the chloroplast. The function of carbon dioxide itself is as the main raw material for the formation of glucose in photosynthesis (Yunia et al., 2019).

Carbon dioxide itself is absorbed through stomata (small pores). The function of water in photosynthesis is as a source of electrons and protons for photosynthetic reactions and is also used for the formation of glucose. Water will be absorbed by the roots and will be transported to the leaves through *xylem*. Chlorophyll in the photosynthesis process has the role of separating water molecules into oxygen, protons and electrons. Chlorophyll is used to capture light energy for photosynthesis (Agusniar, 2015).

c) Misconception Analysis of Problem Number 3

A total of 20% of learners experience misconceptions, assuming that leaves that are colored other than green do not experience photosynthesis because the leaves are different colors do not have green leaves. Learners should answer if plants that have leaves other than green can still do photosynthesis. The color on different leaves is due to the presence of other pigments besides chlorophyll. Such as *anthocyanins* (red, purple and blue colors) and *carotenoids* (yellow, orange and red colors) (Dwilestari & Desstya, 2022).

d) Misconception Analysis of Problem Number 4

A total of 5% of learners experienced misconceptions. Learners assume that glucose is not the result of photosynthesis. Learners should answer if glucose is the result of photosynthesis. Learners who do not experience misconceptions are expected to answer if in photosynthesis plants produce oxygen (O_2) and glucose ($C_{(6)}H_{(12)}O_6$) (Yunia et al., 2019). Glucose itself can be stored in the form of starch found in various plants, such as roots, stems and seeds.

e) Misconception Analysis of Problem Number 6

A total of 20% of learners experienced misconceptions. Learners think photosynthesizing plants emit carbon dioxide because when plants photosynthesize plants need it, so plants produce the gas. Learners should answer if during photosynthesis plants do not emit carbon dioxide, but oxygen and glucose (Yunia et al., 2019). Carbon dioxide is the main raw material needed by plants during the photosynthesis process.

f) Misconception Analysis of Problem Number 7

As many as 80% of students experience misconceptions think that at night plants do not

experience photosynthesis because there is no sunlight. Students should answer if plants at night also experience photosynthesis with the help of light from the lamp (Yunia et al., 2019). But plants that experience photosynthesis are only exposed to lamplight. With light from the lamp allows plants to photosynthesize longer and at night plants can photosynthesize.

g) Misconception Analysis of Problem Number 8

As many as 75% of students experienced misconceptions. Learners assume that photosynthesis can only occur during the day because the sun during the day is sufficient for the photosynthesis process. Learners should answer if photosynthesis in plants does not only occur during the day, although during the day the sunlight is very sufficient for plants to photosynthesize. In the morning plants also experience photosynthesis, when the sun rises plants begin to photosynthesize because the sun is enough. While at night plants also experience photosynthesis but only plants that are exposed to light from lamps with the same wave as the sun even with dim lighting (Yunia et al., 2019).

h) Misconception Analysis of Problem Number 9

A total of 10% of learners experienced misconceptions. Learners assume that the function of chlorophyll is to convert carbon dioxide into oxygen. Learners are expected to answer if converting carbon dioxide into oxygen is not the function of chlorophyll. In photosynthesis,(Yunia et al., 2019) the function of chlorophyll as absorbing sunlight is used to convert carbon dioxide and water into glucose and oxygen.

Tabel 5. Percentage of Misconceptions in Students of Digestive System Material

No Question	Interview Questions	Percentage %			
		PK	PKS	MS	KP
11.	The pancreas, rectum and anus are part of the digestive system.	15%	25%	10%	50%
12.	The small intestine in the digestive system functions for the absorption of vitamins and fluids contained in the remaining food waste.	0%	5%	20%	75%
13.	The chemical digestion process starts in the mouth and continues into the stomach and ends up in the small intestine	10%	25%	15%	50%
14.	Mechanical digestion takes place in the stomach	35%	0%	0%	65%
15.	The liver is not related to the digestive system	0%	5%	45%	50%
16.	The amylase enzyme ptyalin is found in the esophagus	0%	5%	35%	60%
17.	Peristalsis is only found in the esophagus.	0%	0%	5%	95%
18.	Ulcer is a disease of the stomach	60%	10%	0%	30%
19.	A large source of energy reserves in the body is fat.	0%	35%	15%	50%
20.	Carbohydrates are food substances found in rice, sweet potatoes and corn.	30%	20%	0%	50%
	Total	**13,5%**	**12,5%**	**16,5%**	**57,5%**
	Average	**13,5%**	**12,5%**	**16,5%**	**57,5%**

Description: 1.PK: Understand the Concept, 2: Partially Understand the Concept, 3: Misconception, 4: Lack of Knowledge (Syuhendri et al., 2019).

a) Misconception Analysis of Question Number 11

A total of 10% of learners experienced misconceptions. Learners assume that the pancreas and rectum are not part of the digestive system. Learners are expected to answer that the pancreas, rectum and anus are part of the digestive system. The function of the pancreas is to produce enzymes in

digestion such as ptyalin enzyme, amylase enzyme and protase enzyme. The rectum in the digestive system as a temporary place for feces and to trigger the urge to defecate. Anus in the digestive system as the last channel in the digestive system for feces (Andayani et al., 2022).

b) Misconception Analysis of Problem Number 12

A total of 25% of learners experienced misconceptions thinking that the absorption of food waste is in the small intestine. Before food enters the small intestine, the food is absorbed in the stomach and the substances will be removed in the small intestine and the absorption of the remaining food waste occurs there and converts it into energy. Learners are expected to answer that the small intestine in the digestive system functions as the absorption of vitamins, fluids and vitamins from digested food. Absorption of the remaining nutrients is the function of the large intestine (Andayani et al., 2022).

c) Misconception Analysis of Problem Number 13

A total of 15% of learners experienced misconceptions. Learners assume that the end of the chemical digestion system ends in the stomach. Learners are expected to answer if chemical digestion starts from the mouth where there is an amylase enzyme that functions to break starch molecules into mlutose. Continues to the stomach where there is the enzyme pepsin which converts proteins into peptides to become smaller to be digested by hydrochloric acid which serves to optimize pepsin and kill pathogens if present in food and ends in the small intestine there are pancreatic enzymes including, pancreatic amylase to break down the remains of complex carbohydrates that are not broken down when in the mouth are converted into maltose and glucose. Pancreatic lipase is used to break down fats into fatty acids. Proteases such as tripin and chymotrypsin that break peptides into amino acids (Andayani et al., 2022).

d) Misconception Analysis of Problem Number 15

A total of 45% of learners experienced misconceptions. Learners assume that the liver is not related to the digestive system and does not have respiratory elements. Learners are expected to answer if the liver is related to the digestive system, the function of the liver during the digestive process is as a producer of bile as a filter to neutralize toxins, drugs and chemicals contained in the blood (Indrajatun & Desstya, 2022). The liver also functions for the storage of vitamin and mineral nutrients such as iron and copper which are released as needed.

e) Misconception Analysis of Problem Number 16

A total of 45% of learners experienced misconceptions. Learners assume that the ptyalin enzyme is found in the esophagus. Some even think that the enzyme is found in the stomach. Learners are expected to answer that the amylase enzyme ptyalin is found in the salivary glands and is responsible for starting the carbohydrate process. It breaks large starches (polysaccharides) into smaller molecules (disaccharides). The ptyalin enzyme does not function actively in the esophagus, when it reaches the stomach the acid in the stomach will inactivate the ptyalin enzyme and then it will continue to the small intestine (Andayani et al., 2022).

f) Misconception Analysis of Problem Number 17

A total of 5% of learners experienced misconceptions. Learners assume that pristaltic motion is only found in kerongkokan. When asked by researchers about the explanation. Learners answer if pristaltic motion only occurs in the esophagus only in students are expected to answer if pristaltic motion is not only found in the esophagus but also in the stomach, small intestine, large intestine (Finna Aprila Wirastuti & Julianto, 2023). Pristaltic motion is very important in the digestive system because it is used to push food into the next digestive tract. Learners assume that gastritis is an ulcer disease that is taken from life experiences and environmental activities.

g) Misconception Analysis of Problem Number 19

A total of 15% of learners experienced misconceptions. Learners assume that milk is a large source of energy. Learners also think that protein is the largest source of energy. Learners are

expected to answer if fat is a large source of body energy (Scientific Biology Education & Qomariyah, 2020).

Tabel 6. Percentage of Misconceptions in Students on the Material of Force and Motion

No Question	Interview Questions	Percentage %			
		PK	PKS	MS	KP
21.	Force is pulling and pushing. While motion is the movement from one place to another...	35%	10%	10%	45%
22.	Spring force is a force that moves due to the influence of magnets.	35%	0%	15%	60%
23.	An object moving against the direction of motion of the object is the effect of friction force	55%	5%	0%	40%
24.	When we play catapult and pull the rubber ketape and then the stone is thrown far away it is because of the effect of friction	35%	0%	25%	40%
25.	A bicycle traveling there is a friction between the wind and the bicycle it includes a magnetic force.	10%	20%	10%	60%
26.	Clay that is turned into a statue or pottery is the effect of force on objects that can affect the shape of objects.	60%	0%	0%	40%
27.	When playing volleyball. The players catapult the ball into the air and several times bounce to the floor until the ball does not move. This is an example of how force can affect the motion of objects.	30%	20%	0%	50%
28.	A paper cut into small pieces is one example of how force can affect the motion of objects.	29%	0%	15%	65%
29.	When a car is traveling at high speed and then stops if you step on the brakes, it is an example of how force can affect the shape of objects.	30%	0%	35%	35%
	Total	**31%**	**5,5%**	**11%**	**43,5%**
	Average	**34,4%**	**6,1%**	**12,22%**	**48,5%**

Description: 1.PK: Understand the Concept, 2: Partially Understand the Concept, 3: Misconception, 4: Lack of Knowledge (Syuhendri et al., 2019).

a) Misconception Analysis Number 21

A total of 10% of learners experienced misconceptions. Learners assume that force is a displacement of place while motion is a pull and push. Learners are expected to answer if force is an interaction that causes changes in the motion of an object. Force can also make a stationary object move, accelerate, slow down and can change the direction of motion of the object. Force can also cause changes in the shape of objects. While motion is the displacement of an object against a reference point over time.

b) Misconception Analysis Number 22

A total of 15% of learners experienced misconceptions. Learners assume that the moving force is influenced by the spring force because the object is attracted towards the magnet. Because the force that attracts each other is the spring force. Learners are expected to answer if an object made of special material moves because the influence of a magnet is the effect of magnetic force. Spring force is an effect on elastic objects when the object is attracted it will return to its original state (Nasution et al., 2021a).

c) Misconception Analysis Number 24

As many as 25% of learners experience misconceptions. Learners assume that when pulling the slingshot is a magnetic force. Learners are expected to answer if when playing slingshot and pulling

the rubber from the slingshot is the effect of spring force (Nasution et al., 2021a).

d) Misconception Analysis Number 25

A total of 10% of learners experienced misconceptions. Learners assume that it is a magnetic force because the wind is attracted to and approaches the bicycle and therefore there is friction. Learners are expected to answer if cycling is an example of friction, because there is friction from the bicycle and the surrounding air (Nasution et al., 2021b).

e) Misconception Analysis Number 28

A total of 15% of learners experienced misconceptions. Learners assume that if the paper that is cut with scissors turns into small paper, it can affect the motion of objects because when cutting the paper, it moves from top to bottom or the paper falls down. Learners are expected to answer that force can affect the shape of objects, one of which is by cutting paper into small pieces (Nasution et al., 2021b).

f) Misconception Analysis Number 29

A total of 35% of learners experienced misconceptions. Learners assume that when the brakes are stepped on when the car is moving, it can affect the shape of the brakes that are stepped on and become blunt until it becomes a change in the object. Participants are expected to answer that when the car is traveling at high speed and the brakes are stepped on, it is an example of a force that can affect the motion of objects. When the brakes are applied, the frictional force found in the brakes and wheels of the car can reduce its speed until it stops (Nasution et al., 2021b).

It can be seen through the three misconception tables above as a whole as follows:

Table 7. Percentage Results of Learners

Material	PK	PKS	MS	KP
Photosynthesis	20%	10%	27%	44%
Digestive System	14%	13%	17%	58%
Force and Motion	34%	6%	12%	48%
Total	68%	28%	56%	14,9%
Average	23%	9%	19%	50%

Description: 1.PK: Understand the Concept, 2: Partially Understand the Concept, 3: Misconception, 4: Lack of Knowledge (Syuhendri et al., 2019)

In the four tables above, it can be seen that overall students experience PK (Concept Understanding) as much as 23%, PKS (Partial Concept Understanding) as much as 9%, MS (Misconception) as much as 19%, (KP) Lack of Knowledge as much as 50%. Judging by the percentage in the table above, many students experience a lack of knowledge. The cause of the lack of knowledge factor in students is due to lack of interest in reading, lack of motivation in reading, no literacy program implemented by the school and no library at school.

Many students experienced misconceptions as much as 9%. The factors that cause misconceptions experienced by students based on observations and results of interview analysis are due to internal and external factors. In internal factors, students experience misconceptions due to low interest in reading in students, lack of understanding of students on the material taught, motivation of students during learning and lack of confidence of students. External factors are learning methods during learning that are less interesting, inadequate library facilities and limited learning resources for students.

CONCLUSION

Conclusion

Based on the results of the research and discussion, it can be concluded as follows:

1. Misconceptions are still experienced by students even though they have learned photosynthesis material by 30%, digestive system material by 16.5% and force and motion material by 11%. This is due to a lack of knowledge on the concepts that have been taught. The causes are lack of interest in reading, lack of motivation in reading, no literacy program implemented by the school and no library at school. As well as the lack of activeness of students during teaching and learning activities.
2. In the misconception factor there are two factors. First, internal factors, students experience misconceptions due to low interest in reading in students, lack of understanding of students on the material taught, motivation of students during learning and lack of confidence of students. Second, external factors are learning methods during learning that are less interesting, inadequate library facilities and limited learning resources for students.

Suggestion

Based on the conclusions contained above, the researcher can suggest

3. Teachers to pay more attention to students and give more emphasis when providing material properly to minimize the occurrence of misconceptions and lack of knowledge in students.
4. Teachers to emphasize things that are demonstrations, concrete examples and discussions on photosynthesis material, the digestive system, force and motion so that students can think more critically and actively in class learning activities.
5. Teachers are expected to provide different learning models and prepare more interactive learning media in addition to learning videos and the surrounding environment.
6. Schools must provide students with the habit of reading books in the library. To minimize the lack of knowledge in students and add literacy insights to students. Schools can also create literacy programs to foster interest and reading habits in students. So that the lack of understanding of the material of students can be realized.

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