

## Students Perceptions of Learning Biology at SMA Negeri 1 Binjai

Maurin Zahra\*, Syarifah Widya Ulfa, Ummi Nur Afinni Dwi Jayanti

UIN North Sumatera

Email Coresponding\*: [maurinzahra14@gmail.com](mailto:maurinzahra14@gmail.com)

**Abstract :** This study aims to identify students' perceptions of learning biology at SMA Negeri 1 Binjai Kab. Langkat. This research is directed at learning that takes place at the school and classes X-IPA, XI-IPA and XII-IPA as research samples. This study uses a survey method. Sampling is by means of *probability random sampling in the form of proportionate stratified random sampling*. because the study population was divided into several strata or sub-groups and separate samples were taken from each sub-group. The number of respondents obtained is 123 students. The instrument used is a questionnaire that has been prepared in such a way and has been validated previously. The results of the analysis show that students' perceptions of biology learning on average show negative results. So the student's perception of learning biology at SMA Negeri 1 Binjai Kab. Langkat is in the unfavorable category. Some of the things that influence students' perceptions of learning biology at SMA Negeri 1 Binjai Kab. Langkat are internal and external factors. Internal factors include students' learning abilities, motivation towards biology lessons and the ability to develop a knowledge. While external factors include the strategies used, learning media and physical conditions that support learning when it is in progress.

### Article History

Received: 15-10-2023

Revised: 18-10-2023

Published: 20-10-2023

### Key Words

content, formatting,  
article.

**How to Cite:** Zahra, M., Ulfa, S., & Jayanti, U. (2023). Students Perceptions of Learning Biology at SMA Negeri 1 Binjai. *Jurnal Teknologi Pendidikan : Jurnal Penelitian dan Pengembangan Pembelajaran*, 8(4), 894-906. doi:<https://doi.org/10.33394/jtp.v8i4.9351>



<https://doi.org/10.33394/jtp.v8i4.9351>

This is an open-access article under the [CC-BY-SA License](https://creativecommons.org/licenses/by-sa/4.0/).



## Introduction

Learning and education are two terms that cannot be separated. Learning refers to what a person needs to do as a subject, and education focuses on what a teacher or trainer needs to do (Sadirman, 2016:12). If there is interaction between teachers and students and between students and students during learning, then the two concepts are integrated into one activity (Sadirman, 2016: 125). In fact, as living beings, it is appropriate for us to know that learning is very important. Learning is not only limited to the level of formal education but our ability to address a problem is also part of learning (Yendalina, 2017:01). The importance of learning is to know the boundaries in a field of knowledge that functions to help every human being in developing their potential. The results of the learning itself are changes in behavior that include cognitive, affective and psychomotor aspects (Silviana, 2017: 2).

The teaching and learning process is not only focused on one science, but many other sciences such as learning natural sciences (Yendalina, 2017:1). One area of natural science is the study of biology. Biology learning is a field of study concerned with the relationship between living organisms and their environment, a process that is always associated with real

world activities (Dimiyati, 2016). Thus through learning biology there is interaction between students and students, students with teachers, and students with their environment (Slameto, 2018: 2). Therefore, students must be able to integrate with the environment, integrate with the ecosystem, and most importantly students must be able to solve biological problems in their surroundings. Learning biology is closely related to how to understand nature systematically, so learning biology is more focused on the process of discovering new things.

As a scientific group that can only be understood systematically, learning biology has a special character that lies in the object being studied, namely living things, themes or problems of biological objects that occur in nature and methods for solving problems in biological objects through scientific work processes (Trianto, 2017). In this case, what is included in the scientific work process is the basic process and the integrated process. The basic processes include observation, classification, measurement, communication, inference and prediction. Whereas what is included in the integrated process is identifying variables, tabulating data, presenting data, in graphical form, describing relationships between variables, collecting and processing data, analyzing research, compiling hypotheses, defining variables operationally, designing research, and carrying out experiments (Dimiyati, 2016)

It was also explained from the decision of the Minister of Education and Culture number 16 of 2007 at the SMA/MA level, explaining that the working principles of biological laboratories and the application of work safety in observation and experimentation, that the process of understanding biological problems covers learning and understanding biological and environmental processes (Permendikbud, 2016: 142). Thus we can see that when the goals of learning biology focus on observation and experimentation, the learning process focuses on student activities to form knowledge through reconstruction activities about biology learning material (Bagot, 2015). With this also the level of understanding and perception of each student about learning biology is definitely not the same, because each student has a different reasoning power (Sholeh, 2017: 130).

In the biology learning process, student perceptions also have a significant effect on learning success (Sholeh, 2017: 131). Perception is about how someone perceives and interprets something (Muwarti, 2013:14). Perception is the student's ability to be limited not only to external stimuli, but also to invisible but visible stimuli that are felt from within the student (Ruri, 2018: 03). Based on this statement it is very clear that students' perceptions of biology learning have a strong influence on the ongoing learning process. Students' perceptions of biology learning vary because each student has their own way of explaining their perceptions.

Based on the results of observations at SMA Negeri 1 Binjai Kab. Langkat can be seen that student learning outcomes are still low. This can be seen from the average test scores of students in biology subjects, only about 20% of almost every grade level are able to achieve scores above the KKM and the rest or more than 60% of students score below the KKM and about 20% students are at the KKM score threshold. Furthermore, based on the results of observations, there were several students who were sleepy. During the learning process, the subject teacher only focuses on the lecture method in teaching and lacks hands-on practice in the laboratory. Even though biology subjects should learn a lot directly from nature or at least in a biology laboratory with complete equipment and materials. However, it is different from

the learning provided by the teacher who only focuses on learning in class without any form of direct practice

Based on these circumstances the researcher assumed that learning activities could be hampered and student achievement in learning achievement was also not optimal. This is due to the low interest of students in learning due to the absence of a positive relationship between student perceptions and the learning provided. Thus the authors draw one conclusion so that learning becomes liked by students, namely by knowing in advance from students about their perceptions of learning biology. This aims to collect information from students about the biology learning process they expect (Djaali, 2016: 105). So that after the information is obtained, educators can prepare new learning, namely preparing learning models and media that must be used for successful learning.

### **Research Methods**

The population in this study were all students of SMAN 1 Binjai Kab. Langkat. The sample is part of the number and characteristics possessed by the population. This research uses *probability random sampling technique* in the form of *proportionate stratified random sampling*. Proportionate stratified random sampling is a sampling technique from elements that are not homogeneous and have a proportional stratum, the strata referred to are age, gender and educational level (Sugiyono, 2019: 82). The way of taking the sample is to know in advance the number of subjects in each sub-group or in this study is to know the number of subjects in each class. Then determined the percentage of the sample size of the entire population. In this study the researchers took 25% for sampling. Taking 25% in each group aims to form a diverse group from each class. In this case the total sample size is 123 students.

The method used in this study is a survey method. Survey research is a type of quantitative research that aims to collect information from a sample through answers to questions given to individuals or groups who generally use a questionnaire as a data collection tool. It is intended to collect organized information using standardized concepts, methods and procedures (Asra, 2015:63).

The data collection tool used is a questionnaire (questionnaire) that has been prepared before conducting research and testing so that it is valid. The questionnaire used in this study was a closed questionnaire about students' perceptions of Biology learning which was prepared using a modified Likert scale. This study uses a type of questionnaire to obtain respondents' answers about themselves and the answers have been provided, so that respondents only have to choose their answers. There are 24 statements in this questionnaire with four answer choices, namely, Always (S1), Often (S), Rarely (JR), and Never (TP). Prior to the implementation of the research, each questionnaire item was validated to test the feasibility of the questionnaire.

#### **1. Validity test**

The research instrument in the form of a closed questionnaire was tested for validity to obtain the validity of the research instrument, so that it could be standardized as a research data collection data instrument (Arikunto, 2018: 64).

Calculation of the validity of the instrument in this study uses the rough Product Moment formula, namely (Arikunto, 2018: 145):

$$r_{xy} = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{\{(N \sum x^2) - (\sum x)^2\} \{(N \sum y^2) - (\sum y)^2\}}}$$

Information:

$x$  = Item scores

$y$  = Total score of questions

$r_{xy}$  = Correlation coefficient between item scores and total scores

$N$  = Many students

$\sum X$  = Number of item scores

$\sum Y$  = Total score of questions

$\sum X^2$  = Sum of the squared scores of the questions

$\sum Y^2$  = Total score of the squares of the questions

The validity testing criterion is that each item is valid if  $r_{xy} > r_{tabel}$

( $r_{tabel}$  obtained from the critical value  $r$  product moment)

## 2. Reliability Test

To determine the reliability in this study using the Alpha Cronbach formula with the reason that the answer to each item is more than one choice. As Suharsimi Arikunto said that the alpha formula is used to find the reliability of instruments whose scores are not zero or for example questionnaires in the form of descriptions (Arikunto, 2009: 109). Suharsimi Arikunto wrote the Alpha Cronbach formula as follows:

$$r_{11} = \left( \frac{n}{n-1} \right) \left( 1 - \frac{\sum \sigma_i^2}{\sigma_t^2} \right)$$

$$\sigma_t^2 = \frac{\sum X^2 - \frac{(\sum X)^2}{N}}{N}$$

$$\sigma_i^2 = \frac{\sum Y^2 - \frac{(\sum Y)^2}{N}}{N}$$

Information :

$r_{11}$  : Reliability sought

$\sum \sigma_i^2$  : Total score variance of each item

$\sigma_t^2$  : Total variance

$n$  : The number of questions

$N$  : Jumlah responden

$\sum X$  = Number of respondents

$\sum Y$  = total score of questions

$\sum X^2$  = sum of the squared scores of the questions

$\sum Y^2$  = total score of the squares of the questions

$\Sigma Y$  = Total score (all items)

The test reliability criteria are as follows:

- 0,800 – 1,00 : very high
- 0,600 – 0,800 : high
- 0,400 – 0,600 : enough
- 0,200 – 0,400 : low
- 0,000 – 0,200 : very low, (Arikunto, 2018: 75).

Furthermore, the research instrument grid is presented as follows:

**Table 1. The student perception instrument grid of biology learning instruments**

NO	Grid	Indicator	Sub Indicator	Positive questionnaire	Negative questionnaire
Student Perception		Absorb	Related student perceptions, materials, media, and facilities in learning biology	1,2,3,4,5	13,14,15,16,17
		Understand			
		Evaluate			
		Absorb	Perceptions about the stages of learning biology	6,7,8,9	18,19,20,21
		Understand			
		Evaluate			
	Absorb	Perceptions about student interaction from the learning given by the teacher in biology learning	10,11,12	22,23,24	
	Understand				
	Evaluate				

To process the data and analyze the data obtained, alternative answers are provided for each item, alternative answers are adjusted to the Likert scale, where answers are given a weight of 1 to 4 (Sugiyono, 2019: 168).

**Tabel 2. Answers and assessment criteria**

Alternative Answers	SKORE	
	Positive	Negative
Always(SL)	4	1
Often(SR)	3	2
Seldom(JR)	2	3
Never(TP)	1	4

After obtaining data from the results of distributing questionnaires, data analysis was then carried out. The data analysis technique in this study is descriptive analysis. The scores from the questionnaire data are calculated using percentage statistics with the following formula:

$$P = \frac{F}{N} \times 100$$

Information:

P = The percentage value of the respondent's answer

F = Frequency of respondents' answers

N = Number of respondents (Sudjono, 2018:43)

While the number of participants from the number of respondents who had previously been determined was 25% of all students or as many as 124 respondents was determined based on the *response rate* or the number of respondents who participated from a predetermined number of respondents. The formula for calculating the *response rate* is as follows:

$$\text{Response rate} = \frac{\text{jumlah responden yang memberikan partisipasi}}{\text{jumlah responden awal}} \times 100\%$$

This *response rate* shows how much the sample participation is willing to participate and the data is successful. According to many experts, the response rate below 80% will give rise to bias (Eriyanto, 2007: 340).

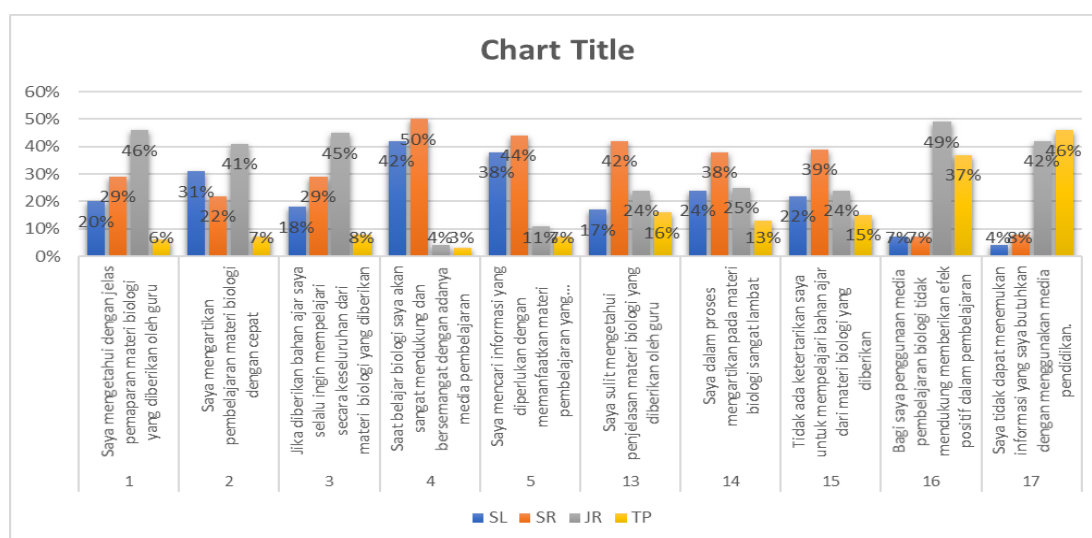
## Research Results and Discussion

### A. Research Results

Student Perceptions of Biology Learning at SMA Negeri 1 Binjai Kab. Langkat in this study was obtained from a questionnaire consisting of 24 statements. This school consists of 3 levels, namely class X, XI and XII. The focus of this research is classes with students majoring in MIPA and only taking a maximum of 25% of the number of students in each class.

#### 1. Students' Perceptions Regarding Materials, Media and Facilities in Learning Biology

From distributing questionnaires to 123 students in the field of student perceptions related to material, media and facilities in learning biology, it was found that all students who were respondents as much as 100% responded to the statement items given, then the acquisition of students' perceptions of biology learning related to material, media and means in learning the results obtained:



**Figure 1. Obtaining Scores of Student Perception Questionnaire Responses Related to Materials, Media and Facilities in Biology Learning**



From the recapitulation of the acquisition of the questionnaire above, the results on the positive questionnaire item, namely number 1, the statement "I know clearly the exposure to the biology material given by the teacher, the result is that the highest score is the rare answer, namely 46% and the least never, namely 6%. Number 2 is the statement I interpret the study of biology material quickly, the result is that the highest score is the rare answer, which is 41% and the least is never, which is 7%. Number 3 is the statement. If given teaching materials, I always want to learn as a whole, from the biology material given, the result is that the highest score is rarely, namely 45% and the least is never, namely 8%. Statement number 4: When studying biology, I will be very supportive and enthusiastic about learning media, the result is that the highest score for the answer is often, namely 50%, and the least is never, namely 3%.

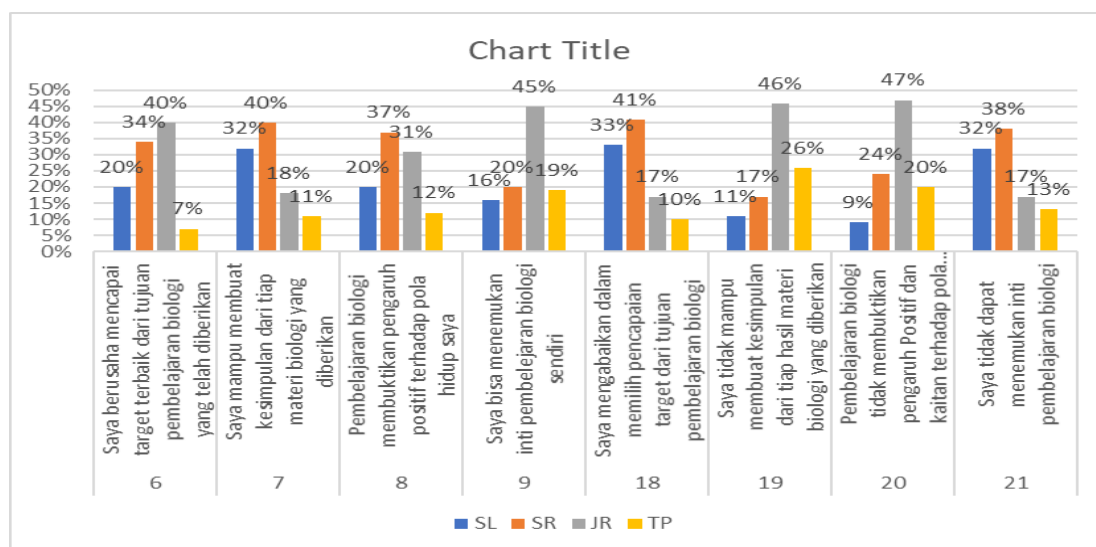
Number 5 is the statement I use the learning media that has been provided to find the information needed to get the percentage that the highest score on the answer is often, namely 44% and the least, never, is 7%. From the results of the positive statements above that produce the highest value or number, the statement number 4 is when studying biology, I will be very supportive and enthusiastic about learning media, which has the highest response, often as many as 50% of students. So the conclusion is that most students feel excited by the existence of biology learning media, this gives us information that learning media can also stimulate students' enthusiasm for learning.

Furthermore, on the negative questionnaire item, namely number 13, the statement I find it difficult to know the explanation of biology material given by the teacher, the result was that 42% of students answered often and 16% of students answered never. Statement number 14 I am in the process of interpreting biology material very slowly, the result is that 38% of students answer often and 13% of students answer never. Statement number 15: I have no interest in learning teaching materials from the biology material provided, the result is that 39% of students answer often and 15% of students answer never. Statement number 16. For me, the use of biology learning media does not support a positive effect on learning, the result is that 7% of students answer often and 49% of students answer rarely.

Number 17 of his statement The use of instructional media prevented me from finding the information needed, the result was that 46% of students answered never and 8% of students answered not often. From the results of negative statements that produce the highest number of statements, namely number 16. For me, the use of biology learning media does not support positive effects in learning, has the highest response, rarely, as many as 49% of students. The conclusion is that during learning not all learning media used can support and have a positive effect on student learning outcomes.

## **2. Students' Perceptions About Biology Learning Stages**

From distributing the questionnaire to 123 students in the field of student perceptions about the stages of learning biology, it was found that 100% of the students who were respondents responded to the statement items given, then the acquisition of students' perceptions of learning biology about the stages in learning obtained the results:



**Figure 2 Obtaining Scores of Student Perception Questionnaire Responses About the Stages of Learning Biology**

From the recapitulation of the acquisition of the questionnaire above, the results on the positive questionnaire items, namely number 6, are the statements I am trying to achieve the best target of the biology learning objectives that have been given, namely the highest 40% of students answer rarely and the lowest 7% of students answer never. Statement number 7 I was able to make conclusions from each biology material given, the results were 40% of students answered often and 11% of students answered never. Statement number 8 Biology learning proves a positive influence on my lifestyle, the result is that 37% of students answer often and 12% of students answer never. Statement number 9: I can find the core of learning biology myself, the results show that 45% of students answered rarely and 19% of students answered never. From the results of the positive statements above which produced the highest number whose statement was number 9 I could find the core of learning biology itself, the highest score was rarely, namely 45% of students. In conclusion, so far students studying biology do not understand what is the core of learning biology by itself.

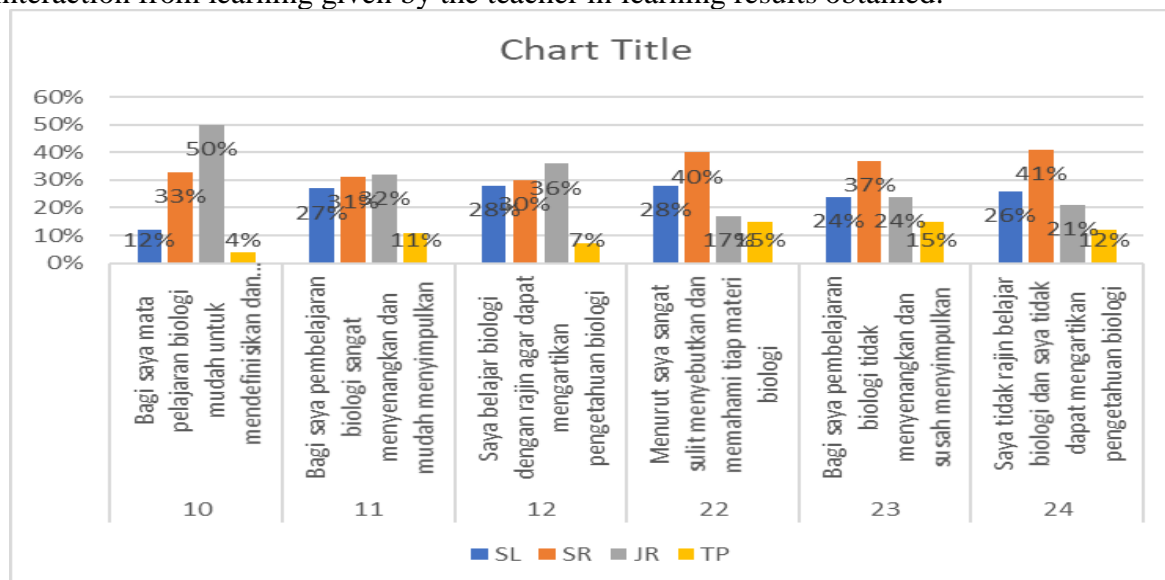
Furthermore, on the negative questionnaire item, namely number 18, the statement I neglected in choosing the achievement of targets from biology learning objectives, the results obtained were 41% of students answered often and 10% of students answered never. Statement number 19 I am not able to make any conclusions from each of the results of the biology material given, the result is that 11% of students answer always and 46% of students answer rarely. Statement number 20 Biology learning does not prove a positive influence and link to my lifestyle, the results show that 9% of students answered always and 47% of students answered rarely.

Statement number 21 is I can't find the essence of learning biology, the results show that 38% of students answered often and 13% of students answered never. From the results of the negative statements above, which resulted in the highest number of statements, namely number 20 Biology learning did not prove a positive influence and a link to my lifestyle, the highest score was rarely obtained, namely 47% of students. In conclusion, learning biology rarely or does not prove a positive influence and linkages to students' lifestyles



### 3. Students' perceptions of student interaction from the learning given by the teacher in biology learning

From distributing questionnaires to 123 students in the field of student perceptions about student interaction from the learning given by the teacher in biology learning, it was obtained that all students who were respondents as much as 100% responded to the statement items given, then the acquisition of students' perceptions of biology learning about student interaction from learning given by the teacher in learning results obtained:



**Figure 3 Obtaining Scores of Student Perception Questionnaire Responses About Student Interaction From Learning Given by Teachers in Biology Learning**

From the recapitulation of the acquisition of the questionnaire above, the results on positive statement items, namely statement number 10. For me, biology subjects are easy to define and understand. The results show that 50% of students answered rarely and 4% of students answered never. Statement number 11. For me, learning biology is very fun and easy to conclude. The results show that 32% of students answered rarely and 11% of students answered never. Statement number 12: I study biology diligently so that I can interpret my knowledge of biology. The results show that 36% of students gave answers rarely and 7% of students answered never. From the results of the positive statements above which produced the highest number whose statement was number 10 for me, biology subjects were easy to define and understand, the highest score was rarely, namely 50% of students. The conclusion is that it is rare for students to understand biology learning easily.

Furthermore, on the negative questionnaire item, namely number 22, the statement. In my opinion, it is very difficult to mention and understand each biology material. The results show that 40% of students answered often and 15% of students answered never. Statement number 23 For me learning biology is not fun and it is difficult to conclude that 37% of students answered often and 15% of students answered never. Statement number 24 I am not diligent in studying biology and I cannot interpret biology knowledge. The results show that 41% of students give answers often and 12% of students give answers never. From the results

of the negative statements above which produced the highest number whose statement was number 24 I was not diligent in studying biology and I could not interpret biology knowledge, the highest score was often obtained, namely 41% of students. In conclusion, students are also often not diligent in studying biology and cannot interpret biological knowledge on their own.

## **B. Discussion**

perceptions related to materials, media and facilities in biology learning, it is measured using 10 statement items taken from the reference indicator of perception expressed by Bimo Walgito. 2 and 3. This is based on the delivery process given by the teacher which is still not optimal. After conducting interviews with students about this and giving answers that the biology teacher's way of presenting the material is too monotonous and less realistic in teaching, less realistic learning what is meant is a form of learning that only explains theory and is just the opinion of the teacher. In this regard, students' willingness to learn is realistic, namely bringing learning closer to problems originating from direct life and carrying out learning applications directly in life, for example by providing direct practice on each biology material.

In addition, the lack of use of learning media that uses standard biology laboratory tools, for example when studying biology material about plant cells, the process of looking at the cells must use a microscope, but the teacher only shows a video on how to use a microscope. This triggers the emergence of boredom in learning. This is in accordance with Sanjaya's opinion (2018: 35) that the usefulness or not of teaching materials depends on the ability of educators to develop and utilize them (Sanjaya, 2018: 35). in statements 4 and 5 which are the highest acquisition of frequent responses giving positive responses, namely giving frequent responses, in this case it means that students will be very enthusiastic if they are invited to learn using learning media. Even though learning is only done occasionally with the use of concrete learning media students are very enthusiastic when the learning process takes place.

Meanwhile in the negative statements, the results obtained in statements 13, 14 and 15 showed that the student's response showed that students' understanding in learning was indeed quite low, this was supported by the statement that they had difficulty understanding biology learning. Evidence of this opinion, namely the source of information from the biology teaching support teacher explained that the average student score was low and as many as 70% of students on the exam scored below the KKM. Even so, student responses to statements 16 and 17, which are the largest gains in rare responses, provide an illustration for the author that when teachers use concrete learning media in the learning process, students will be enthusiastic about learning and often make it easier for students to access the information needed in learning. This is in line with Arsyad's opinion (2017: 5) that the use of learning media also encourages a strong desire for students to learn the teaching materials presented. In terms of students' perceptions about the stages of learning biology, it is measured using 8 statement items, with 4 positive statements and 4 negative statements. From the positive statement in questionnaire number 6, the biggest result is that students rarely try to achieve the best targets in learning, then the gains in questionnaires number 7 and 8 have the biggest gain in frequent responses, namely students are often able to conclude

teaching material and are able to prove that learning biology can provide positive influence in learning. However, in questionnaire number 9, which is the largest questionnaire acquisition, the results are rarely obtained, most students are rarely able to find the core of learning. After conducting an interview with one of the respondents, the writer received an answer that sometimes the teacher did not explain the learning material as a whole so students did not know what goals had to be achieved in the learning process.

In this case learning will be easily absorbed by students if the teacher provides an explanation of the material as a whole and is supported by learning media in accordance with the material being studied (Muslich, 2018: 56). In the opening stage, the teacher should provide apperception at the opening stage of learning and in the closing part of the lesson, evaluate the level of student understanding. In the negative questionnaire item number 18, the results show that most students often ignore achieving the best targets in biology learning. Then in questionnaire number 19 the students were able to conclude learning biology and most of the students also got a positive influence when learning biology which was obtained from the 20th questionnaire item. All of these negative things occur as a result of the learning stages carried out by the teacher are not fully in accordance with the rules of the curriculum. This is in line with Sadiman's opinion (2018: 17) that learning objectives have been set in the Education curriculum, the expected outcomes for students are not only an increase in knowledge, but also an increase in skills, experience and application. Other things also suggest that educators as much as possible in the learning process.

In positive statements, the highest results were obtained, that it is rare for students to understand biology learning easily. In the author's interview with a respondent, why do you think learning biology is difficult to understand, then the respondent answered that learning biology is actually easy, especially when practicing directly in nature, but the learning they receive is more focused on learning in class, the condition is that the educator only provides notes. only to students. And rarely are students able to conclude or be able to interpret biology learning. In this case the authors assume that educators are less than optimal in inviting students to find students' thinking concepts with their respective levels of intelligence. This is in accordance with the opinion of Dimiyati (2016: 26) that the best biology teaching method is to invite students to discover their own thinking concepts based on their level of knowledge.

Furthermore, the information from the negative questionnaire obtained the results that most students often had difficulty understanding biology material, then thoughts often arise that it is difficult to conclude biology material and so on because the highest number of results is found in statement number 24 which answers students are also often not diligent in studying biology and not can interpret biological knowledge. Then after conducting an interview with one of the students the author answered that biology learning at the school was still lacking in terms of using media in learning. The lack of equipment in the laboratory and the teacher's lack of creativity in using other media makes students seem bored in learning. This arises because the learning they receive is only focused on theory and does not provide learning in the form of practice.

## Conclusion

From the results of the discussion regarding students' perceptions of biology learning at SMA Negeri 1 Binjai Kab. Langkat, the authors can conclude that: 1) Students' perceptions of biology learning on average show negative results. So students' perceptions of biology learning at SMA Negeri 1 Binjai Kab. Langkat is in the less good category. 2) Some of the things that influence students' perceptions of learning biology at SMA Negeri 1 Binjai Kab. Langkat are internal and external factors. Internal factors include students' learning abilities, motivation towards biology lessons and the ability to develop a knowledge. While external factors include the strategies used, learning media and physical conditions that support learning while it is in progress.

## Suggestion

From this research, the authors draw several important things that can be used as future reference for readers, namely:

1. For students, they should increase their enthusiasm for learning to better understand biology learning such as the biology learning objectives set out in the curriculum
2. For teachers, they should pay more attention to students' perceptions regarding biology learning, push themselves more towards learning creations that further build student enthusiasm. another thing is changing the classic learning model into learning that is full of creativity and provides more learning in the form of practice. Provide clear learning references and more often use learning models in the form of tangible forms.
3. For other researchers, hopefully this research can be a reference in further studies

## Reference

- Ashra, A. et al. (2015). *Survey Research Methods*. Bogor: In Media
- Arifin, Z. (2017). *Education Research*, Bandung: Rosdakarya.
- Arikunto, S. (2018). *Research Procedures A Practice Approach: Revised Edition V*. Jakarta: Bumi Aksara.
- Arsyad, A. (2017). *Instructional Media*. Jakarta: Rajawali Press.
- Astuti, S. P. (2017). *The Effect of Initial Ability and Learning Interest on Physics Learning Achievement*. Formative: Scientific Journal of MIPA Education, 5(1), 68- 75.
- Azwar, S. (2016). *Research methods*. Yogyakarta: Learning Library.
- Bagod, S, and Laila, S. (2015). *Biology Science in Life*. Jakarta: Yudhisthira.
- National Education Standards Agency. (2006). *Guidelines for Compilation of Education Unit Level Curriculum for Elementary and Secondary Education*. Jakarta: National Education Standards Agency.
- Danim, S. (2018). *Student Development*. New York: ALPHABETA.
- Djamaluddin, A. (2019). *Learning And Learning*. Yogyakarta: CV. Kaffah Learning Center.
- Eriyanto. (2007). *Public Opinion Analysis Sampling Technique*. Yogyakarta: LKIS
- Fitriani, F. (2014). *Student Perceptions About Library Management at SMA Negeri 2 Basung, Lubuk*. Journal of Educational Administration. 2(1) 33-34.

- Jayawardana. (2017). *Biology learning paradigm in the digital era*. Biodukatika journal. 5(1), 56-57
- Maulid. (2017). *Student Perceptions of Biology Learning at SMA Al Falah Abu Lam U Aceh Besar Thesis*. Aceh: Ar-Raniry State Islamic University
- Muslich, M. (2018). *Character Education*. Earth Script: Jakarta.
- Mulyasa. (2017). *Character Education Management*. Earth Script: Jakarta.
- Ministry of National Education Language Center. (2008). *Indonesia Dictionary*. Jakarta: Language center.
- Sadirman. (2016). *Teaching and learning interaction and motivation*. Jakarta: PT Raja Grafindo.
- Sadiman, Arief S. (2018). *Educational Media*. Jakarta: PT. King of Grafindo Persada. 125-126
- Saguni, F. (2017). *Perceptions of Women's Physical Appearance in Adolescence*. Journal for gender studies. 4(2) 23-24
- Sanjaya, W. (2017). *Educational Process Standard Oriented Learning Strategy (12th Printing)*. Jakarta: Kencana.
- Sanjaya, W. (2018). *Educational Process Standards Oriented Learning Strategies*. Jakarta: Kencana Prenada Media.
- Sudirman, D. (2019). *Class IX Student Perceptions of the Implementation of the Science Learning Process Based on the 2013 Curriculum of SMPN 2 Lengayang Thesis*. Lengayang.
- Sudarisma, S. (2016). *Understanding the Nature and Characteristics of Learning Biology in an Effort to Respond to the Challenges of the 21st Century and Optimizing the Implementation of the 2013 Curriculum*. Journal of Florea, 2 (1): 3.
- Sugiyono. (2019). *Educational Research Methods (Quantitative, Qualitative, and R&D Approaches)*. Bandung: Alfabeta.
- Tanjung, I. F. (2016). *Teachers and Inquiry Strategies in Learning Biology*. Journal of Tarbiyah.
- Tafonao, T. (2018). *The Role of Learning Media in Increasing Students' Interest in Learning*. Journal of Educational Communication. 2(2), 24-25 .
- Thobroni, M. (2018). *Learning and Learning: Discourse Development and Learning Practices in National Development*. Yogyakarta: Ar-Ruzz Media.
- SISDIKNAS Law. (2010). *National Education System*. Jakarta: Media focus.
- Walgito, B. (2017). *Introduction to General Psychology*. Yogyakarta: Andi Offset
- Yuni, Y., et al. (2020). *Guided Discovery Learning Against Junior High School Students' Mathematical Generalization Ability*. Journal Of Instructional Mathematics, 1(1), 20-30