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# Students' Perceptions about Science and Learning Innovation in Junior High School

**Dina Syaflita, M. Rahmad, Muhamad Nor, Ernidawati, Naila Fauza**  
Physics Education, Faculty of Teacher Training and Education, Riau University  
[dinasyaflita@yahoo.com](mailto:dinasyaflita@yahoo.com)

**Abstract** – The learning process affects students' perceptions of a subject. This perception affects student motivation. The selection of appropriate learning methods and media needs to be done. Innovations on learning tools such as learning media need to be provided in order to produce meaningful learning activities and generate positive student perceptions of learning. This study has two objectives, 1) to determine the tendency of the choice of methods and learning media for students' perceptions of science subjects, and 2) to obtain a picture of students' expectations in technology integrated science learning as a form of learning innovation. This type of research is descriptive research. The sample used was teachers and students in the city of Pekanbaru and outside the city of Pekanbaru. Data collection instruments used in the form of interview sheets and questionnaires. The data analysis technique used is descriptive analysis. The results showed that students' perceptions that often carry out experimental activities were better than perceptions of students who often carry out learning by discussion methods. The use of teaching aids as a learning medium is better pictures and videos in forming students' positive perceptions of science learning.

Keywords: Learning methods; Media; Student's perception

## 1. Introduction

Students' perceptions about a learning environment affect learning outcomes (Guo, 2018). Perception of a lesson influences students' interest in learning student interest in a lesson influences students' intrinsic motivation. Motivation is an important factor in the learning process (Depasque and Tricomi, 2015). If the student's perception is good, then the lesson will be liked. Conversely, if students' perceptions are not good for a lesson, then the lesson will not be liked and can cause low learning outcomes. Therefore, creating learning innovations to increase student motivation is what the teacher needs to do.

Educational institutions need to create a learning environment that encourages student activity (Guo, 2018). Innovation in education can help students to improve their learning outcomes. Active learning basically seeks to have interested and motivated students. All student-oriented learning results better than traditional learning (Rodriguez, et al, 2019). Student-oriented learning such as problem based learning for long-term knowledge retention and application of knowledge (Yew and Goh, 2016), project based learning that enables students to take a role in the learning environment and take responsibility for their own learning (Gultekin in Ergul and Kargin, 2014), inquiry learning with investigative and experimental learning can improve student learning outcomes in the form of procedural, epistemic, and social abilities (Furtak et al, 2012) can be a reference for implementing active student learning. In addition, currently also developing integrated learning the latest technology. The teacher can choose a learning model with a variety of learning methods and media.

Learning methods and media used by teachers affect the quality of learning (Handika, 2012) including learning outcomes, interests, and students' perceptions of a subject. Teachers can use a variety of learning methods in learning. The accuracy of the selection of learning methods will determine the

achievement of student learning outcomes (Kurniawan, 2013). The selection of instructional media is based on the learning objectives to be achieved. Learning media can improve the quality of learning (Rusman, 2012).

The description that has been explained leads to the conclusion that students' perceptions of learning are very important, because perception is related to motivation, and motivation influences learning outcomes. Educational innovation is needed to accelerate learning goals and foster students' positive perceptions. This study has two objectives, 1) to determine the tendency of the choice of methods and learning media for students' perceptions of a subject, and 2) to obtain a picture of student expectations in technology integrated science learning as a form of learning innovation.

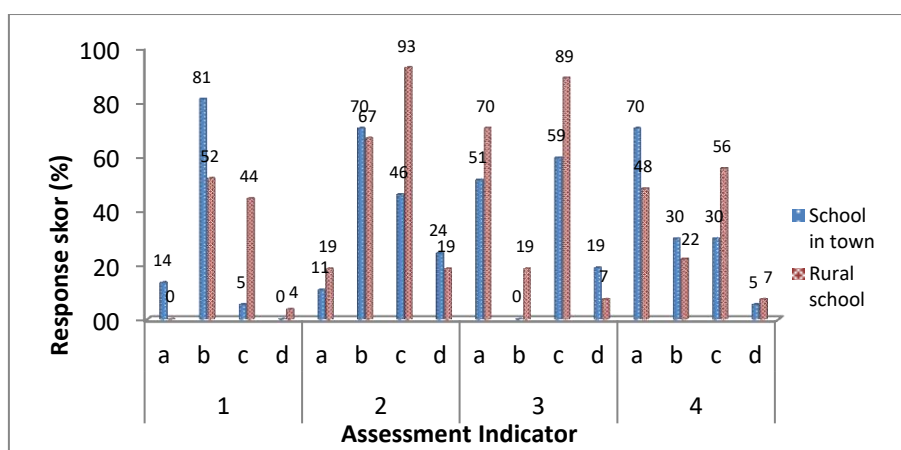
## 2. Methodology

The research conducted is a descriptive study in which the data taken is used to describe the learning of science carried out. Samples taken are 52 respondents with 50 students and 2 teachers. 50 students consisted of students in the city of Pekanbaru and outside the city, 2 teachers who became the study sample were one science teacher who taught in the city of Pekanbaru and one teacher who taught outside the city of Pekanbaru. The research instrument used was the interview instrument given to the teacher and the questionnaire instrument given to students. The data analysis technique used is descriptive analysis technique by describing all indicators obtained in the study. All data obtained are primary data.

## 3. Result and Discussion

### A. Result

The learning process given by the teacher influences students' perceptions of learning. An interesting learning process by actively involving students provides a more meaningful learning experience. Student-centered learning is more effective than teacher-centered learning (Anyanwu, 2015). The results of research on the method and media assessment of students' perceptions obtained are shown in Figure 1. These results refer to the research of Rahmad et al (2019).



**Picture 1.** Graphic Results of Students' Responses about Learning Science Physics, Methods and Media Reference: Rahmad et al, 2019

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The results of the analysis of the four criteria are:

1. Physical Science learning includes subjects that are: a) very difficult, b) difficult, c) easy, and d) very easy
2. The methods that are often used in learning Natural Sciences are: a) lectures, b) discussions, c) experiments, d) other models
3. Types of media that are often used in learning Natural Physics: a) pictures, b) videos, c) experiment tools, and d) other media.
4. Types of media that are most appropriate in learning a material on environmental pollution and global warming: a) media images, video media, c) experimental props, and d) others.

## **B. Finding and Argument**

As shown in Figure 1, the question of students' perceptions of science learning shows that about 95% of students in Pekanbaru stated that learning science is difficult, only 5% said science was easy. While the questionnaire filled out by students outside the city of Pekanbaru stated that 52% gave a science response was difficult and 44% said it was easy and even 4% said it was very easy. Based on the results obtained it can be concluded that the perception of students outside the city of Pekanbaru on learning science is better than students in the city of Pekanbaru.

Learning methods and learning resources used turned out to affect students' perceptions of a subject. This research shows that the method most widely used by teachers in science learning is discussion and experimentation. When seen in the second indicator of learning methods that are often used in learning, students in cities more often carry out learning by the discussion method. Unlike the case with schools outside the city which states that the method most often used is the experimental method. Referring to the first indicator, students in Pekanbaru City at the most assume that science is difficult. Students in the city of Pekanbaru more often use the discussion method, this means the discussion method is considered less effective in forming positive perceptions of students towards learning science than the experimental method. The discussion method can be effective as long as the discussion that occurs is a discussion that maximizes the interaction of students with students and students with teachers, as the results of research Guo, Yang & Shi (2017) that students who have more interaction with teachers and their groups have more positive perceptions and learning outcomes better.

Based on these data it turns out that in science learning, the experimental method makes it easier for students to digest the concepts of science. Even so, it is still the perception of students who say that science is difficult is still above 50%. This means, teachers need innovation in the experimental activities carried out. Guo Yang & Shi's research (2017) shows that the learning environment created by teachers influences students' perceptions. The interactive process between teacher and student can improve learning outcomes. Therefore, the teacher needs to innovate in the experimental method to improve students' positive perception of science where students not only focus on the tool but also have sufficient interaction with the teacher while carrying out the experimental learning.

The results of interviews with science teachers and the results of questionnaires given to students show the results that teachers outside the city more often use the media in the form of experimental props while teachers in the city of Pekanbaru more often use pictures and videos. Based on this data, it can be concluded that it turns out that teaching aids are better at giving rise to students' positive perceptions of science than media images and videos. Even so, still the perceptions given by students

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outside the city of Pekanbaru above 50% stated that science is difficult. This becomes the task for teachers to innovate the teaching aids that will be used in learning.

There are many forms of innovation in learning that can be done to shape students' positive perceptions of science learning. One form of learning innovation is through the use of sophisticated science into learning. Technological advances are integrated into effective learning supporting learning (Kori et al, 2013). The educational process must be enhanced by technological advancements (Ivanovic et al, 2018). The development of science and technology can improve the quality of learning and the development of the quality of learning can produce quality science and technology (Lin, et al, 2017). Technological progress can be an option to introduce science concepts to students (Faloon, 2019). Through the adoption of science and technology in learning students are expected to be more motivated in learning.

Referring to research conducted by Rahmad, et al (2019), where it is necessary to innovate the teaching aids according to learning needs by considering the wishes of students as users. Research Rahmad, et al (2019) revealed that it turns out that in learning science on environmental pollution material students want a teaching aid that can measure air quality in their area. The tool is expected to detect many air pollutants, is portable, easy to use, and has instructions for use. They support the development of tools that display digital data to measure air quality in their area. This is consistent with the opinion of Nawzad et al (2018) which states that learning science supported by technology can increase student interest and learning outcomes. Thus, innovation in learning by utilizing the latest technology can be a recommendation to improve students' positive perceptions of science.

#### **4. Conclusion**

The difference in the trend of learning methods and media used affects students' perceptions of science learning. Students who are often given learning by the experimental method have a more positive perception of learning science than the discussion method. Students who often use teaching aids in learning can also increase students' positive perceptions of science. This perception will certainly have an impact on student motivation. Implementation of learning with a variety of teaching aids and innovating on instructional media is what teachers need to do so that students are more interested and have a positive perception of learning science.

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#### **References**

- Anyanwu, S.U., Iwuamadi, Fidelia N., 2015, Student-centered Teaching and Learning in Higher Education: Transition from Theory to Practice in Nigeria. *International Journal of Education and Research*, 3 (8), 349-358.
- DePasque, S., Tricomi, E., 2015, Effects of Intrinsic Motivation on Feedback Processing During Learning. *NeuroImage*, 119 (2015), 175–186.
- Ergul, N. R., Kargin, E. K., 2014, The Effect of Project Based Learning On Student's Science Success. *Procedia – Social and Behavioral Sciences*, 136 (2014), 537-541.

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- Furtak, Erin M., Seidel T., Iverson, Heidi., Briggs, D. C., 2012, Experimental and Quasi-Experimental Studies of Inquiry-Based Science Teaching: A Meta-Analysis. *Review of Educational Research*, 82 (3), 300–329.
- Guo J., 2018, Building bridges to student learning: Perceptions of the Learning Environment, Engagement, and Learning Outcomes among Chinese Undergraduates. *Studies in Educational Evaluation*, 59 (2018), 195-208.
- Guo, J., Yang, L., & Shi, Q., 2017, Effects of Perceptions of The Learning Environment and Approaches to Learning on Chinese Undergraduates' Learning. *Studies in Educational Evaluation*, 55 (2017), 125-134.
- Handika, J., 2012, Efektivitas Media Pembelajaran IM3 Ditinjau dari Motivasi Belajar. *Jurnal Pendidikan IPA Indonesia*, 1 (2), 109-144.
- Ivanović, M., Milićević, A.K., Aleksić, V., Bratić, B., Mandić, M., 2018, Experiences and Perspectives of Technology-enhanced Learning and Teaching in Higher Education – Serbian Case. *Procedia Computer Science*, 126 (2018), 1351–1359.
- Kori, K., Pedaste, M., Leijen, Ä., Mäeots, M, 2014, Supporting Reflection in Technology-Enhanced Learning. *Educational Research Review*, 11 (2014), 45–55.
- Kurniawan. A.D., 2013, Metode Inkuiri Terbimbing dalam Pembuatan Media Pembelajaran Biologi untuk Meningkatkan Pemahaman Konsep dan Kreativitas Siswa SMP, *Jurnal Pendidikan IPA Indonesia*, 2 (1), 8-11.
- Lin, M.H., Chen, H.C., and Liu, K.S, 2017, A Study of the Effects of Digital Learning on Learning Motivation and Learning Outcome. *EURASIA Journal of Mathematics Science and Technology Education*, 13 (7), 3553-3564.
- Nawzad, L., Rahim, D., Wakil, K., 2018, The Effectiveness of Technology for Improving the Teaching of Natural Science Subjects. *Indonesian Journal of Curriculum and Educational Technology Studies (IJCETS)*, 6(1), 15-21.
- Rahmad, M., Syaflita, D., Noer. M., Susanti, M., 2019, Needs Analysis of Air Quality Detection Tool in Project Based Learning. URICES.
- Rodríguez, M., Díaz, I., Gonzalez, E. J., Miquel, M.G. 2019. Reprint of: Motivational active learning: An integrated approach to teaching and learning process control. *Education for Chemical Engineers*.
- Rusman, 2012, *Belajar dan Pembelajaran Berbasis Komputer Mengembangkan Profesionalisme Abad 21*. Bandung, Alfabeta.
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