

## DOES REWARD AFFECT THE ACCURACY OF PUPIL PERCEPTION?

**Lalu Hamdian Affandi**

Universitas Mataram, Indonesia

E-mail: [hamdian.fkip@unram.ac.id](mailto:hamdian.fkip@unram.ac.id)

**Mohammad Archi Mauluda**

Universitas Mataram, Indonesia

E-mail: [archimaulyda@unram.ac.id](mailto:archimaulyda@unram.ac.id)

**Muhammad Erfan**

Universitas Mataram, Indonesia

E-mail: [muhammaderfan@unram.ac.id](mailto:muhammaderfan@unram.ac.id)

**Vivi Rachmatul Hidayati**

Universitas Mataram, Indonesia

E-mail: [vivirachma@unram.ac.id](mailto:vivirachma@unram.ac.id)



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### Abstract

Accuracy of perception is the ability of individuals to recognize, organize, and interpret input from the environment and it is influenced by the level of individuals' concentration on observing an object. When we can find out the causes of individual perceptual accuracy, we can design a learning instrument to enhance this ability. The purpose of this study is to examine the effect of reward on the accuracy of pupils' perceptions. The study employs a comparative experimental approach, in which 20 subjects are divided into two groups: 10 subjects were promised rewards and 10 subjects were not. The accuracy of perception is measured by the length of time used by subjects when completing two different levels of tests. The more time required by subjects to complete the test, the more inaccurate perceptions of research subjects. To test hypotheses, the researcher performed the Split-Plot Anova technique on the subject's length of time completing the tests. The result shows that the p-value is 0.115, greater than 0.05 which means that there was no influence of giving rewards on the accuracy of perception.

**Keywords:** reward, the accuracy of perceptions.

### Abstrak

Kecermatan persepsi merupakan kemampuan individu dalam mengenali, mengorganisasikan, serta memaknai hal-hal yang berada di lingkungan sekitar dan dipengaruhi oleh tingkat konsentrasi individu dalam mengamati suatu objek. Ketika kita dapat mengetahui penyebab kecermatan persepsi yang dimiliki individu, kita dapat merancang sebuah instrumen pembelajaran untuk meningkatkan kemampuan ini. Oleh karena itu penelitian ini bertujuan untuk menguji pengaruh pemberian penghargaan terhadap kecermatan persepsi peserta didik. Penelitian yang menggunakan kaidah kuantitatif dengan pendekatan eksperimen komparasi ini membagi 20 subyek ke dalam dua kelompok yaitu 10 subyek yang dijanjikan reward dan 10 subyek tidak dijanjikan reward. Kecermatan persepsi subyek diukur dengan tes yang diberikan sebanyak dua kali menggunakan instrumen yang berbeda dengan memperhatikan lama waktu subyek menyelesaikan tes. Semakin banyak waktu yang dibutuhkan oleh subyek dalam menyelesaikan tes, semakin tidak cermat persepsi subyek penelitian. Data rentang waktu subyek dalam mengerjakan tes dianalisis dengan teknik Split-Plot Anova. Hasil penelitian menunjukkan bahwa nilai signifikansi yang diperoleh adalah 0,115 lebih besar dari 0,05 sehingga dapat disimpulkan bahwa tidak ada pengaruh antara pemberian penghargaan dengan kecermatan persepsi yang dimiliki subyek.

**Kata kunci:** penghargaan, kecermatan persepsi.

## Introduction

The principle of behaviorism is still the basis of many pedagogical interactions in the classroom. Broadly speaking, the principle of behaviorism which is often the choice of educators in the learning process is reward and punishment. Reward, or later more popular in the study of psychology as reinforcers, is a mechanism that can be done to increase the chances of the emergence or repetition of expected behavior<sup>1</sup>. Giving rewards to pupils raises debates among experts regarding the impact caused. According to Ikhwanuddin,<sup>2</sup> the provision of rewards to improve learning outcomes can psychologically affect pupil productivity. Giving a reward for each assignment completed by an individual will affect the individual's thought process in carrying out the next task. If individuals are accustomed to completing tasks based on reward, it will be difficult to be productive if no reward is given<sup>3</sup>. This is what might happen if giving rewards is often done in the learning process.

However, according to the results of Handayani's<sup>4</sup> study, pupil learning outcomes can improve if they are encouraged with a prize. Pupils tend to be more motivated in completing assignments when the teacher gives the lure of prizes. In line with the results of the

study, Wahyu et.al<sup>5</sup> showed that giving rewards or prizes can improve the competency side of pupils. In this study, Portillo & Fernández-Baena<sup>6</sup> design classes in the form of tournaments, and pupils who can solve problems and are in the first, second, and third positions will get prizes. This shows that pupils are very enthusiastic about learning, even when prizes are only given to a few pupils (not all pupils) pupils remain enthusiastic in the learning process. This data is supported by the results of a survey conducted by Slamet & Maarif<sup>7</sup> where at each level of education the percentage of pupils who liked the application of rewards in learning more. At the elementary school level, 73% of pupils like the learning process using rewards. At the junior high school level, 62% of pupils liked giving rewards in learning, while at the secondary school level the figure dropped to 55%. Despite the decline, in general, most pupils still like the learning process using rewards.

Besides being able to affect the learning outcomes of pupils, rewarding is also assumed to be able to affect the accuracy of pupils' perceptions. The word accuracy of perception is indeed less popular in the world of education in schools. According to Senkbeil et. al<sup>8</sup> the education system, especially in Indonesia, only focuses on the value or the result of learning. Aspects that occur during the learning process

<sup>1</sup> Ann Lieberman and Ann Lieberman, "Improving Schools," in *Teaching, Learning and Living*, 2nd ed. (New Jersey: Joosey-Bass Publishers, 2018).

<sup>2</sup> Ikhwanuddin, Pendekatan Reward Active Cooperative (RAC) Pada Pembelajaran Praktik Gambar Teknik Mahasiswa Non Reguler Jurusan Teknik Sipil dan Perencanaan Fakultas Teknik UNY. *JPTK*, 18(2), (2019): p, 170–188.

<sup>3</sup> Slamet and Samsul Maarif, "Pengaruh Bentuk Tes Formatif Asosiasi Pilihan Ganda Dengan Reward Dan Punishment Score Pada Pembelajaran Matematika Siswa Sma," *Infinity: Journal of Mathematics Education* 3, no. 1 (2014): p, 59–80.

<sup>4</sup> Handayani, Structure and Written Expression Section on Paper-Based TOEFL: Perceived Difficulties by Nursing Pupils of Poltekes Solok, West Sumatera. *Jurnal EUCATIVE: Journal of Educational Studies*, 4(2), (2019): p, 170-180.

<sup>5</sup> Wahyu, Tuty, Widiyanti, & Utami, *Korelasi Faktor Pembentuk Persepsi dengan Persepsi Konsumen Terhadap Media Pemasaran Online*. 3984(2) (2017): p, 108-115.

<sup>6</sup> Portillo & Fernández-baena, Psicología Educativa Social Self-perception in Adolescents: Accuracy and Bias in their Perceptions of Acceptance / Rejection. *Psicología Educativa*, 26(1), (2020): p, 1-6.

<sup>7</sup> Slamet & Maarif, Pengaruh bentuk tes formatif asosiasi pilihan ganda dengan reward dan punishment score pada pembelajaran matematika siswa sma. *Infinity: Journal of Mathematics Education*, 3(1), (2014): p, 59-80.

<sup>8</sup> Senkbeil, Ellis, & Reed, The Influence of Tornado Activity, Impact, Memory, and Sentiment on Tornado Perception Accuracy among College Pupils. *Atmosphere Article*, 10(2), (2019): p, 198-211

such as pupils' perceptions of learning are ignored.

Perception is a series of processes of introduction, organizing, and understanding of input from the environment that occurs when a stimulus hits the senses<sup>9</sup>. Through this process, individuals build assumptions about the world they live in<sup>10</sup>. According to Niehorster & Li,<sup>11</sup> the quality of this perception is determined by the accuracy of the individual in observing an object. When individuals have a high level of accuracy, the assumptions produced tend to be precise and of high quality. Based on this, it is interesting to explore data related to the accuracy of pupils' perceptions.

On the other hand, the reward has been used as a way to modify behavior to achieve certain learning goals<sup>12</sup>. Behavior modification is related to the process of habituating actions that are not yet possessed by pupils, such as discipline, habitual learning, and so on. This research is important because it opens up new domains related to reward, namely the relationship between reward and perception. More specifically, researchers will explore data about the accuracy of perception with the aim of research to examine the effect of giving rewards to the accuracy of pupils' perceptions.

## Method

This research uses quantitative principles with a comparative experimental approach. A comparative experimental approach is a research approach that is carried out when the researcher wants to compare two categorized

data groups<sup>13</sup>. In this case, the measured pupil's perception is the accuracy of pupils in understanding a pictorial problem. The research objective was to explore the relationship between pupil decisions when determining answers and the reward given if the pupil's answer was correct. This research was conducted by recruiting 2 groups of pupils as experimenters who were in charge of giving treatment to research subjects, namely pupils in grades 1-3 of elementary school. Each pupil group then gave treatment to 10 pupils each. So that a total of 20 elementary school pupils were the research subjects in this research project. The research subjects were grouped into 2 groups, namely groups that were promised rewards and groups that were not promised rewards after completing the perceptual accuracy test. To measure the accuracy of perceptions, research subjects were given two tests using 2 different instruments.

The instrument developed refers to the gestalt law of perception, namely similarity. The principle of similarity states that the closer one object is to another, the harder the brain works to find the differences between these objects<sup>14</sup>. This principle is translated into a perceptual accuracy-test instrument into 2 levels of difficulty. In the first instrument, research subjects were asked to find the letter "O" between the jumbled letters "L". because the letter "O" is relatively not similar to the letter "L", this test is classified as an easy level test.

**Table 1. Level 1 Research Instruments**

L	L	L	L	L
L	L	L	L	L
L	L	O	L	L
O	L	L	L	O
L	L	L	L	L

Source: Johan Wagemans et al.<sup>15</sup>

<sup>9</sup> Emily E. Ledue et al., "Pharyngeal Sense Organs Drive Robust Sugar Consumption in *Drosophila*," *Nature Communications* 12, no. 3 (2015): p. 456–467.

<sup>10</sup> João R Daniel et al., "Perception Accuracy of Affiliative Relationships in Elementary School Children and Young Adolescents," *Frontiers in Psychology* 8, no. 11 (2017): p. 55–65.

<sup>11</sup> Niehorster & Li, Accuracy and Tuning of Flow Parsing for Visual Perception of Object Motion During. *I-Perception*, 2(3) (2017): p. 90-108.

<sup>12</sup> Ibid

<sup>13</sup> J. W Creswell, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research (4th Ed.)*, 4th ed. (Boston, MA: Pearson, 2012).

<sup>14</sup> Pharyngeal Sense Organs Drive Robust Sugar Consumption in *Drosophila*." *Nature Communications* 12, no. 3 (2015): p. 456–467

<sup>15</sup> Johan Wagemans et al., "A Century of Gestalt Psychology in Visual Perception: I. Perceptual

In the second instrument, research subjects were asked to find the letter "E" between the jumbled-up letter's "F". Based on the similarity principle, the second test is considered more difficult because the shape of the letter "E" is very similar to the letter "F". In certain subject groups, experimenters promised a reward in the form of a "lollipop" if the research subjects could find the desired letter. Whereas in the control group, research subjects were not given anything after finding the requested letter.

**Table 2. Level 2 Research Instruments**

E	F	E	E	E
E	E	E	E	E
E	E	E	F	E
E	E	E	E	E
E	F	E	E	E

Source: Johan Wagemans et al.<sup>16</sup>

To measure the accuracy of perception, researchers calculate the time needed for research subjects to complete the task that is in the research instrument (perception accuracy test). The assumption is that the more time required by the subject, the more inaccurate perceptions of research subjects. Data about the time taken by research subjects were then analyzed using the Anova Split-Plot technique which allows researchers to find the difference in time required by the two groups of research subjects based on the presence of reward and the level of difficulty of the test.

### Finding and Discussion

#### Finding

The findings of the study were analyzed by using SPSS software. This data analysis was carried out to examine the effect of giving rewards on the accuracy of perception. The total amount of data analyzed is 40. But after a

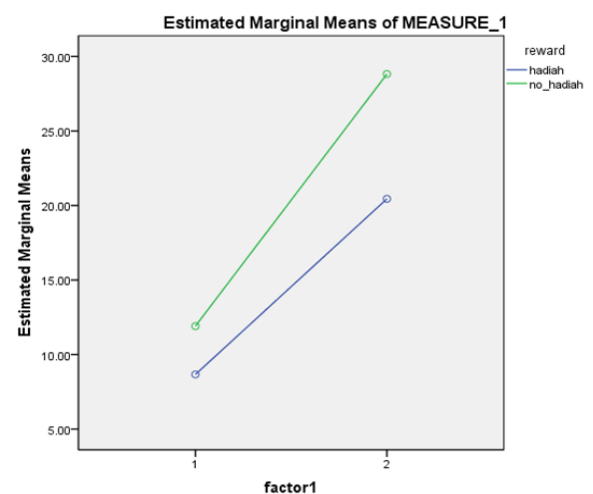
Grouping and Figure-Ground Organization." *Psychological Bulletin* 34, no. 2 (2012): 556–567 Grouping and Figure-Ground Organization," *Psychological Bulletin* 34, no. 2 (2012): p, 556–567.

<sup>16</sup> Ibid.

deeper examination, the amount of data was reduced to 20 data. The following table is the results of the analysis of the data obtained:

**Table 3. Split-Plot Anova Results**

Tests of Between-Subjects Effects						
Measure: MEASURE_1						
Transformed Variable: Average						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	12071.565	1	12071.565	99.239	.000	.846
Reward	333.965	1	333.965	2.745	.115	.132
Error	2189.535	18	121.641			



**Figure 2. Profile Plot Data**

Based on Table 3, the significance level of the data is 0.115. According to Hake<sup>17</sup> the second level of data is said to be mutually influential if the significance level <0.05. Because the value obtained is 0.115, the results are obtained that there is no influence between giving rewards with the accuracy of perception possessed by the subject.

Figure 1 shows graphically there is no relationship between reward giving and perceptual accuracy. In set-up theory,

<sup>17</sup> Hake, *sign-Based Research in Physics Education Research: A Review*, in A.E Kelly, R.A. Lesh, & J.Y. Baek, eds. (in press), *Handbook of Design Research Methods in Mathematics, Science, and Technology Education* (1st ed.). New York: (SAGE Publication,2007).



according to Jana Krejčí<sup>18</sup> the absence of a line that intersects/intersects each other illustrates that the two aspects/objects do not have a significant relationship. This can be seen from the blue line, which is the class visualization that was awarded a prize. Meanwhile, the green line is a visualization of the class that was not awarded a prize. Both the blue line and the green line also have almost the same trend line. This illustrates the accuracy of the pupils who are awarded prizes and are not significantly different.

### **Discussion**

#### *Learning Experience*

One factor that can determine the accuracy of an individual's perception is the individual's learning experience<sup>19</sup>. The results of the study which showed that there was no relationship between the accuracy of perception with the provision of rewards were suspected because of the varied learning experiences of the subjects. According to Lestari & Siswanto<sup>20</sup> individuals who work on questions that are of the same type as those previously done tend to have a greater chance of solving those problems.

The learning process goes beyond memorizing character education and the acquisition of academic skills which are expressed in pupil achievement scores. The success of pupils, according to both views, lies in a change in the way pupils interpret the reality of life and learning experiences so that they become more reflective, inclusive, and tolerant of the views of others but remain

critical and autonomous. For this reason, a transformative perspective rooted in the thoughts of Mezirow and Freire is very suitable to be used to explain the learning experiences of disadvantaged adolescents who receive education in non-formal channels. The concept of learning from experience (pedagogy of experience) aims to "freeing pupils from the oppressive cultural frames of knowing by providing them with new ways of claiming authority for their own experience". Pupils who can justify their learning experience are those who are free from oppression. A critical pedagogical framework can explain the isolation issues of disadvantaged adolescents, and how they are re-attracted to and involved in learning from a critical/sociological perspective rooted in Freirean educational philosophy. Educational theories and practices rooted in transformative perspectives and critical pedagogy have the aim that education should stimulate social change rooted in pupil learning experiences as a process of increasing awareness. This means that the main agenda of non-formal education for disadvantaged children and youth is to develop critical awareness among marginalized groups. Thus, the purpose of implementing education in this pathway is to help pupils understand and understand the reality of life in a critical way, increase self-confidence, and stimulate them to recognize their capacity and be able to maintain their identity to open up possibilities and opportunities in the future.

This is also a key factor in completing the perception accuracy instrument given in this study. If the subject has been given a test item before, it has already been given a type of question, then it is very likely that the subject can complete the instrument in a shorter time. This is also shown from the results of the study. Because when researchers give the same test questions to the subject, the subject's time record when examining the instrument is also faster. Based on this, the subject's learning

<sup>18</sup> Jana Krejčí, "Fuzzy Set Theory," in *Studies in Fuzziness and Soft Computing*, 5th ed. (Reston: Sanata Dharma University Press, 2018).

<sup>19</sup> Mohammad Ansyar, "Pengembangan Kurikulum Dari Materi Pelajaran Ke Pengalaman Belajar," *2Jurnal Ilmu Pendidikan* 8, no. 1 (2016): p, 28–37.

<sup>20</sup> Lestari & Siswanto, The Effect of School On-The Job Experiences, Pupil Achievement in Productive and Social Support on Pupil Work Readiness of Vocational High School. *Jurnal Pendidikan Vokasi*, 5(2), (2017): p, 183–194.

experience can affect the results of the subject's perceptual accuracy.

#### *Learning Outcomes*

Learning outcomes of research subjects are also suspected to be a factor that determines the relationship between reward and perceptual accuracy. Many research results show that rewarding can improve learning outcomes. According to research results Powell et. al<sup>21</sup> in children aged 7-10 years, a child will be more motivated to do something if given the lure of a gift or praise after successfully achieving it. The results of this study are also supported by the research conducted by Marjolein Luman et al<sup>22</sup> which states that parents often use rewards (gifts) as a tool to direct their children. Though psychologically Lindsey et. al<sup>23</sup> explained that giving gifts to "educate" children is something that is not good because children will get used to expecting rewards for everything he does.

At school, some students are often lazy, unpleasant, absent from the classes, and so forth. In this case, it seems that the teacher fails in providing the right motivation to encourage them to work with all their might and mind. Many children's talents do not develop because the right motivation is not obtained. If a person is given the right motivation, there will be an extraordinary combination of energy. Therefore, unexpected results can be achieved. Motivating actions will be more successful if the goals are clear and

recognized by the motivated person and by the needs of the person being motivated. Therefore, every person (educator) who will provide motivation must know and understand the background of life, the needs and personality of the person to be motivated, and the theories on how motivation can work. The learning motivation possessed by pupils will have an impact on their learning outcomes. The learning outcomes can be maintained if the learning outcomes obtained by pupils tend to remain or increase.

Dealing with these problems, many ways are ranging from methods, strategies to learning tools used by teachers in making pupil learning outcomes increase. This method can be done by regulating and providing good situations in the pupil environment, generating self-competition, giving rise to feelings of satisfaction with the results and achievements that have been achieved even though the results are small. Several ways to improve pupil learning outcomes in schools are by giving rewards to pupils. Giving rewards can increase pupils' self-confidence because they feel appreciated by their teachers. The rewards that can be given are by providing additional value, giving gifts, praise, and awards to pupils.

As a tool, rewards have an important meaning in developing the character of pupils. Rewards, in this case, are meant a way to please and excite pupil learning, both at school and at home. So, in giving rewards it is not just giving to pupils, but the most important thing is the result, namely the formation of a conscience or a strong will for pupils to always learn anywhere and anytime. Giving rewards cannot be done carelessly, but it must be seen when and to whom the reward should be given. Rewards are given to pupils. It's just the problem, which pupils should get the reward. Rewards do not have to be given to the smartest pupil in the class but also given to pupils who are less intelligent if they have shown better learning achievement than

<sup>21</sup> Elisabeth M. Powell, Leslie A. Frankel, and Daphne C. Hernandez, "The Mediating Role of Child Self-Regulation of Eating in the Relationship between Parental Use of Food as a Reward and Child Emotional Overeating," *Appetite* 56, no. 3 (2017): p, 452-478.

<sup>22</sup> Marjolein Luman et al., "Reward and Punishment Sensitivity in Children with ADHD: Validating the Sensitivity to Punishment and Sensitivity to Reward Questionnaire for Children (SPSRQ-C)," *Journal of Abnormal Child Psychology* 5, no. 3 (2012): 56-78.

<sup>23</sup> Lindsey Roberts, Jenna M. Marx, and Dara R. Musher-Eizenman, "Using Food as a Reward: An Examination of Parental Reward Practices," *Appetite* (2018).

before. Even if necessary, rewards are also given to all pupils in one class, if one day they have shown better learning outcomes than before.

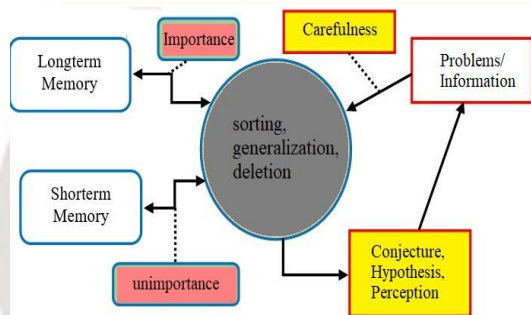
Thus, giving rewards can be given individually or in groups. To determine whether a good reward is given to pupils is a very difficult thing. If it is wrong, then it will not be able to play a good role. It is not uncommon to have negative effects on pupils.

Focus on elementary school pupils, giving rewards is one way that teachers do in the learning process in improving pupil learning outcomes. This is a precondition that must exist in oneself to motivate pupils to learn, which in turn has implications for learning outcomes. This means that there is an effect of rewards in improving learning outcomes.

On the other hand, learning outcomes are also closely related to the accuracy of individual perceptions. In mathematics, for example, Croft, Kouvela, & Paul<sup>24</sup> said that solving mathematical problems requires accuracy in understanding the problems given.

and Shiffrin paradigm model. Sensory memory records information or stimuli that enter through one or a combination of the five senses, namely visually through the eyes, hearing through the ears, smells through the nose, taste through the tongue and touch through the skin. If the information or stimuli are not paid attention to, it will immediately be forgotten, but if it is paid attention, the information is transferred to the short-term memory system. The short-term memory system stores information or stimuli for about 30 seconds and only about seven chunks of information can be stored and maintained in the short-term memory system at any one time. Once in the short-term memory system, the information can be transferred again by repeating it to the long-term memory system for storage, or it can be lost/forgotten because it is replaced by additional new chunks of information (displacement).

Furthermore, after being in the long-term memory system, the information can be retrieved through certain strategies, or the information is forgotten (failed or cannot be recovered) due to deficiencies in the filing system. Schematically, the memory structure system is presented in Figure 3. Some of the definitions contained in short-term memory include (a) grouping items into chunks and (b) coding of information. Each stimulus is coded differently based on the specific characteristics possessed by the stimulus itself. Each stimulus can be coded additively (acoustically), visually, or semantically. However, coding of information in short-term memory will be mostly auditive or acoustic and visually complemented. Therefore, there are several types of memory, including auditive memory and visual memory. The capacity to visually remember incoming stimuli, such as pictures and the like, with extraordinary clarity, is known as photographic memory or eidetic imagery. In both auditive and visual memory, the incoming stimuli are processed asymmetry



**Figure 3. Information Processing**

Source: Translate (Hoque, 2017)<sup>25</sup>

Memory structures can be divided into three systems, namely: (a) sensory memory system, (b) short-term memory (STM) system, and (c) long-term memory (LTM) system). This memory system is known as the Atkinson

<sup>24</sup> Croft, Kouvela, & Paul, This is what you need to be learning: an analysis of messages received by first-year mathematics pupils during their transition to university. *Math Ed Res J*, 30(1) (2018): 165-183

<sup>25</sup> Source: Translate (Hoque, 2017)



in the brain. The left ear, which is processed by the right hemisphere, is dominant towards musical chord stimuli, the pitch of notes and melodies, while the right ear, which is processed by the left hemisphere, is more sensitive in capturing stimuli such as words, numbers, and consonants. Forgetting that occurs in short-term memory is closely related to information retention and reappearance factors. Learning short-term memory is the first step in understanding long-term memory. But actually, the human memory system is very complex, so that short-term memory and long-term memory are only a model and not an actual structure in the brain. The model is simply a hypothetical construct that helps explain how complex the memory system is.

Short-term memory does exist based on two premises, namely: (a) as a general proposition a person should be able to hold information in short intervals of time and (b) according to Hebb's suggestion that if general activity continues for several periods, structural changes in synaptic contacts between the cells can carry the memory afterward. Short-term memory has a very small capacity, but a very large role in the memory process, which is where we process stimuli that come from our environment. This small information storage capability corresponds to limited processing capacity. Short-term memory functions as transitory storage that can store very limited information and transform and use that information in generating responses to a stimulus.

The ability to remember the past and use that information to use it today is a function of long-term memory. The long-term memory system allows us to live in two worlds, the past and the present, and thus enables us to understand the endless flow of direct experience. The most special things about long-term memory are its unlimited capacity and its seemingly never-ending duration.

A given problem usually requires careful analysis of the individual to select incoming information. This incoming information then undergoes processing in the brain and produces conjectures, guesses, opinions, or in this study is a perception<sup>26</sup>. The more careful the individual is in analyzing a problem, the better his perception will be. If you have a good perception, it will continue to understand and solve the problem well. So that will result in increased learning outcomes. However, the assumption of the relationship between reward giving and learning outcomes, cannot ensure that there is an influence between reward giving and the accuracy of perceptions that individuals have.

#### *Visual-Spatial Ability*

The concept of spatial thinking is quite interesting to discuss considering the many previous studies that found that children find it difficult to understand objects or geometric shapes. Spatial thinking is a collection of cognitive skills, which consists of a combination of three elements, namely spatial concepts, representation tools, and reasoning processes.

Spatial ability is a concept in spatial thinking. Classification of spatial abilities can be done into three categories, namely: (1) spatial perception, (2) mental rotation, and (3) spatial visualization. Viewed from the context of mathematics, especially geometry, it turns out that spatial abilities are very important to be improved, this is based on the results of the following research. Every pupil should strive to develop skills and spatial sensing which are very useful in understanding the relationships and properties in geometry to solve mathematical problems and problems in everyday life. The perception of an object or image can be affected significantly by the

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<sup>26</sup> Destina Wahyu Winarti et al., "Learning The Concept of Area and Perimeter by Exploring Their Relation," *IndoMS. J.M.E* 3, no. 1 (2012): 41–54.



object's orientation. To be able to recognize an object/image precisely, spatial abilities are required. Pupils with high spatial abilities are significantly more capable in mathematics. Other research has shown that cognitive abilities such as spatial abilities are predicted to succeed in certain learning environments, particularly in geometry. Good spatial abilities will enable pupils to detect relationships and changes in geometric shapes.

If viewed from the context of everyday life, spatial abilities also need to be improved, spatial ability is a major intelligence factor that is not only important for mathematics and science but also necessary for success in many professions. Children need spatial abilities in exploration activities, for example when they paint, color, paste, play with folding paper, etc. A pilot also really needs high spatial skills to know well where the ground/field while he is maneuvering. Likewise, a ship captain must need high spatial abilities in carrying out his duties.

In the context of the relationship between disciplines/fields of study, spatial abilities are needed. In industrial technology, spatial capabilities are very useful in applications such as simulation, multi-media, and modeling. It takes good spatial skills to be able to learn and solve engineering problems. Almost all topics in "machine drawing" require high spatial skills. In the National Academy of Science, it is said that many fields of science require spatial skills in the application of these sciences, including astronomy, education, geography, geosciences, and psychology. The importance of spatial ability is needed in engineering and mathematics sciences, especially geometry. This ability is not found genetically but as a result of a long learning process.

The instrument given in this study can be used to measure the visual-spatial abilities of

an individual. Vrijesen inside Maulyda<sup>27</sup> never gave a similar instrument but used wooden blocks that were made similarly, and the research subjects were asked to sort wooden blocks from the smallest to the largest size. This kind of test is believed to be able to hone and at the same time show how the visual-spatial abilities of individuals.

According to Van Garderen & Montague<sup>28</sup> visual-spatial ability is the individual's ability to interpret the object being seen appropriately. Related to this, the type of instrument given also requires good visual-spatial skills from the subject to solve it. Researchers assume that the results of the study show that there is no influence between perceptual accuracy and reward, due to different visual-spatial abilities in each research subject. So, it is necessary to have new boundaries that can minimize the influence of variables beyond the accuracy of perceptions and giving rewards.

### Conclusion

Based on the results of research and discussion, it can be concluded that there is no difference between the awarding of the accuracy of perception. There is no difference between giving an appreciation of the accuracy of this perception about learning participation (subjects who have taken the same type of test) as well as differences in visual-spatial abilities in each research subject. The results of this study indicate that gift-giving treatment cannot affect the accuracy of pupils' perceptions. So that teachers should no longer use rewards as a stimulus in classroom learning. For further

27 Mohammad Archi Maulyda, "Representasi Matematis Anak Yang Berbakat Di Bidang Musik Dalam Menyelesaikan Masalah Matematika" (Universitas Malang, 2018), <http://karya-ilmiah.um.ac.id/index.php/disertasi/article/view/69262>.

28 Van Garderen, D, and M Montague. "Visual-Spatial Representation, Mathematical Problem Solving, and Pupils of Varying Abilities." *Learning Disabilities Research and Practice* 18, no. 4 (2003): 246–254.

research, it can be done to measure the relationship between the accuracy of perceptions and other aspects such as praise, giving vocabulary questions, giving questions in the form of stories, and so on.

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