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IMPLEMENTATION OF GAGNE'S THEORY ON MATHEMATICS LEARNING OUTCOMES

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Abstract
This research aims to help us understand the learning process that occurs within children. Its application in learning addition and subtraction in 7-year-old children.
This research uses a descriptive method, namely describing or explaining variables in the field based on a literature review. Data regarding learning outcomes in addition and subtraction material for children aged 7 years as a research sample were obtained through questions. Remembering the concepts that will be studied such as addition is used to add the number of numbers with numbers, and subtraction to subtract the number of numbers with numbers.
The researcher gave 5 candies and gave the child a question, he had to do the question correctly and precisely, if he was wrong then the candy would be deducted. So the results of this research show that there is an influence of the application of learning using Gagne's theory on the learning outcomes of 7 year old children.
Keywords: Application of Gagne's Theory

INTRODUCTION

Learning is the result of an interaction between stimulus and response (Slavin, 2000). A person is considered to have learned if they can show changes in their behavior. According to this theory, what is important in learning is input in the form of stimulus and output in the form of response. Stimulus is something that the teacher gives to students, while response is a reaction or response of students to the stimulus given by the teacher. The process that occurs between stimulus and response is not important to pay attention to because it cannot be observed and cannot be measured. What can be observed is stimulus and response, therefore what is given by the teacher (stimulus) and what is received by students (response) must be observable and measurable (Putrayasa, 2013:42)
In Siregar (2014: 4), "learning is a process of changing one's behavior
Individuals because of the interaction between individuals and their environment so that they are better able to interact with their environment.
One of educational psychology is the basis of human behavior. Education seeks to develop good life behavior. This behavioral approach gave birth to several theories and concepts from many researchers. (Rusli RK and MA Kholik. 2013. Learning theory in educational psychology. Journal of Social Humanities 4(2): 62-67).

Learning theory is a combination of interconnected principles and explanations of a number of facts and discoveries related to learning events. The use of learning theory with correct development steps and choice of subject matter as well as the use of good message design elements can make it easier for students to understand what they are learning. Apart from that, the learning atmosphere will feel more relaxed and enjoyable. The learning process is essentially an invisible mental activity. This means that the process of change that occurs within someone who is learning cannot be witnessed clearly, but can be seen from the symptoms of change (Nahar, Novi Irwan. 2016)

METHOD

The method used is a descriptive method, namely describing or explaining variables in the field based on a literature review. Information is collected by reading literature in the form of responses. The stimulus is whatever the researcher gives to the research subject, while the response is the research subject's reaction or response to the stimulus given by the researcher. The process that occurs between stimulus and response is not important to pay attention to because it cannot be observed and cannot be measured. What can be observed is stimulus and response, therefore what is given by the researcher (stimulus) and what is received by the research subject (response) must be observable and measurable.

RESULTS AND DISCUSSIONS

1. E. Thorndike's Learning Theory (Connectionism)

One of the proponents of this behavioristic learning theory was Edward Lee Thorndike (1874-1949). According to Thorndike, learning is the event of forming associations between events called stimulus (S) and response (R). A stimulus is a change in the external environment which becomes a sign to activate an organism to react or act, while a response is any behavior that occurs because of a stimulus (Burhanuddin,

2008) Thorndike suggests that the association between stimulus and response follows the following laws: (Moreno, 2010 p. 163)

1. The law of readiness, namely the more prepared an organism is to obtain a change in behavior, the implementation of that behavior will give rise to individual satisfaction so that associations tend to be strengthened.
2. The law of exercise, namely the more often a behavior is repeated/rehearsed (used), the stronger the association will be.
3. Law of effect, namely the stimulus response relationship tends to be strengthened if the consequences are pleasant and tends to be weakened if the consequences are unsatisfactory.

Based on the above, it is explained that behaviorist learning theory, especially according to Thordike, is a change in behavior through stimuli and responses. This means that changes in behavior are formed in accordance with environmental desires because individuals respond in accordance with the stimuli provided. Apart from that, the response given will be good, if the person is ready to receive the stimulus, thereby creating satisfaction for the individual himself. To get good learning results in the form of changes in behavior, the stimulus should be given repeatedly, so that the response given is also better.

Thorndike's famous theory is the theory of connectionism, which is the result of his research on animals which have been the focus of his attention for many years regarding the behavior of these animals. This connectionist theory is known as the "trial and error" theory. This theory was inspired by the trondike about the experiment of a cat which was kept in a box and everything around it was installed starting from the lever, then the door latch and the rope that connected the two. These tools were so well arranged by Throndike that when the cat could pull the string he could open the door and be able to eat the food that had been prepared.

According to Gagne (Sagala 2013:17) says that "Learning is a change that occurs in human abilities that occurs after continuous learning, not only caused by the growth process alone. Learning occurs when a stimulus situation together with the contents of the memory influences the student in such a way that his actions (His performance) changes from the time before he experienced the situation. According to Gagne (Mudjiono 2010: 10) says that "Learning is a set of cognitive processes that change the nature of environmental stimulation, through information processing, into new capacities". It can be concluded that learning is a process of changing a person's behavior that is created as a result of processing new information with previously gained experience.

The concept of mathematics learning according to Gagne's theory has several kinds of learning outcomes (in Drisscoll), namely verbal information, intellectual skills, cognitive strategies, attitudes and motor skills. 3 In achieving the learning outcomes in mathematics learning discovered by Gagne, of course a teacher will understand first about what to do and prepare students in order to achieve learning goals or learning outcomes. The learning outcomes that will be achieved according to Gagne are as follows: 1. Verbal Information. According to Ruseffendi (in Upu) a verbal series is a sequenced verbal act of two or more series of stimulus response activities. 4 In this case the teacher can give questions to students to train them. Students in answering orally, writing and drawing. In accordance with Gagne's opinion (in Slameto that verbal learning.

GAGNE'S THEORY

There are 9 applications of this theory:

1. Generate interest and focus the attention of the subject.
2. Convey learning objectives.
3. Recall the concepts/principles that have been learned which are prerequisites
4. Deliver learning material
5. Provide guidance or guidelines for learning
6. Obtain performance (responding) to the subject
7. Provide feedback on the correctness of task implementation (reinforcement)
8. Measuring/evaluating learning outcomes.
9. Strengthen retention and transfer of learning

Explanation:

1. We must attract the subject's attention by conveying something new, strange.

2. Provide information about learning objectives so that children do not guess what is expected of them by researchers. They need to know what performance will be used as an indicator of mastery knowledge/skills.
3. Much new knowledge is a combination of previously learned concepts, principles or information, to make it easier to learn new material.
4. When explaining learning material, use examples, emphasis to show differences or important parts, either verbally or using certain features (colors, italics, underlining, etc.).
5. Guidance is provided through questions that guide the subject's thought process/flow. Care must be taken that guidance is not given excessively. Students are asked to show what they have learned, both to convince researchers and themselves.
6. Feedback needs to be given to help the subject know the extent of the truth or performance they produce.
7. Measuring learning outcomes can be done through tests or assignments (for example laboratory work). It is necessary to consider the validity and reliability of the tests given and the results of the researcher's observations.
8. Retention can be improved through repeated practice using principles learned in different contexts. The conditions/situations when learning transfer is expected to occur must be different. Solving problems in a classroom atmosphere will be very different from a real situation that contains risks.

Applications include:

For grade 1 elementary school subjects, subtraction and addition material is given. First, we have to attract the child's attention because when we provide new material, it will make the child focus and be interested in paying attention.

Then provide information about the purpose of learning subtraction and addition, for example, we can count the number of family members, the number of friends in class, or we can also count the apples bought and what is left after eating them.

Next, remember the concepts that will be studied such as addition which is used to add the number of numbers with numbers, and subtraction to subtract the number of numbers with numbers.

Give the material, I give 5 candies and I give the problem the child has to do the problem correctly and precisely, if it is wrong then the candy will be deducted

Provide guidance, tell the child to do it, if I have done it, I will discuss it

The question and see the child's answer.

Gave feedback, corrected it and I took the candy according to the wrong amount. Assessing the child's learning outcomes, we ask again what the difference is between addition and subtraction. We provide information that addition will definitely result in more, while subtraction will result in less.

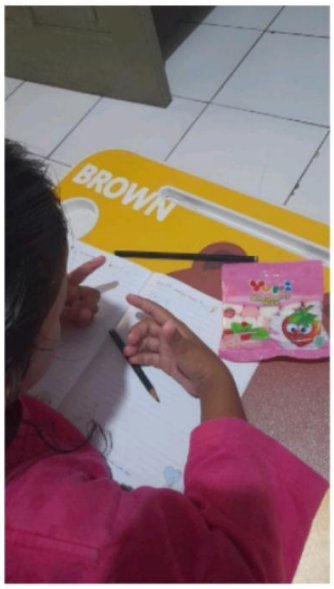

Figure 1: Doing the questions and counting

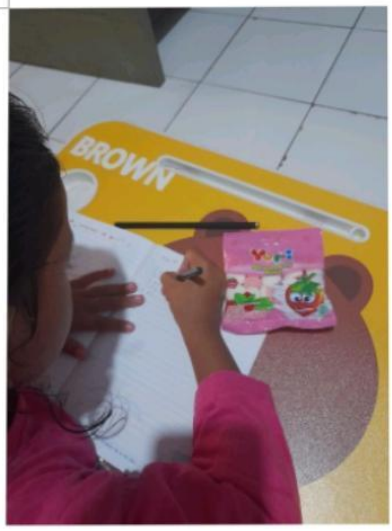

Figure 2: Write answers

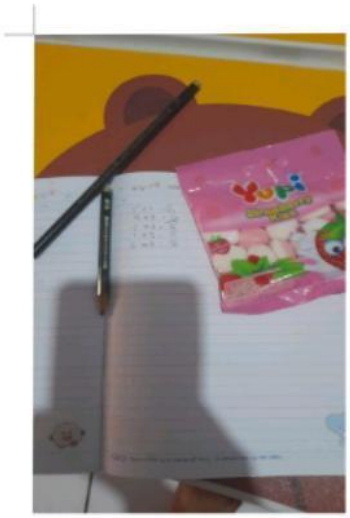

Figure 3 : Results

CONCLUSION

Robert's learning theory. M. Gagne helps us to understand the learning process that occurs within children, understand the conditions and factors that can influence, facilitate or hinder the child's learning process so that they can act appropriately. Learning hierarchies are a sequence of abilities that students must master in order to learn things that are more difficult or more complex. Learning activities cannot be carried out haphazardly, but must use certain theories and learning principles, for example Robert's theory. M. Gagne to act appropriately.

REFERENCES

Generator, M. (2023). View Of Robert M. Gagne's Learning Theory And Its Implications For The Importance Of Centers

Learning Resources. Accessed 13 July 2023, From Https://Jurnalteknodik. Kemdikbud.Go.id/Index Php/Jurnalteknodik/Article/View/421/269

Rusli Rk & Ma Kholik. (2013). Learning Theory in Educational Psychology. Journal of Social Humanities4(2):62-67.

Https://Core.Ac.Uk/Download/Pdf/228440151.Pdf

Tarihoran, D., Nau Ritonga, M., & Lubis, R. (2021, November 1). Robert Mills Gagne's Learning Theory and Application in Mathematics Learning. Mathedu Journal (Mathematics Education Journal), 4(3), 361367.

Https://Doi.Org/Https://Doi.org/10.37081/Mathedu, V413.2242

Amsari, Dina. "Implications of E. Thomdike's Learning Theory (Behavioristics) in Mathematics Learning." Basicedu Journal, Vol. 2, No. 2, 19 October 2018, Pg. 52-60.

Https://Www.Neliti.Com/Publications/278126/implications-Teori-Belajar-Ethorndike-Behavioristik-In Learning-Mathematics

Santoso, E, Pamungkas, M., Rochmad, R., & Isnarto, I. (2021). Behavioral Theory (E. Throndike) In Mathematics Learning. Prisma, Proceedings of the National Mathematics Seminar, 4, 174-178.

Https://Journal. Unnes Ac. Id/Sju/Index Php/Prisma/Article/View/44939

Nahar, Irwan Novi. Behavioristic Learning Theory in the Learning Process", Journal of Social Sciences Vol 1, No 1 (2016).

Http://Jurnal Umtapsel Ac.id/Index. Php/Nusantara/Article/View/94

Siregar (2014: 4) "Implications of E. Thorndike's Learning Theory (Behavioristics) in Mathematics Learning"

Https://Www.Neliti.Com/Publications/278126/Implikasi-Teori-Belajar-Ethorndike-Behavioristik-Dalam- Mathematics-Learning

(Putrayasa, 2013:42) "Application of Behavioristic Learning Theory in the Learning Process"

Http://Jurnal Um-Tapsel Ac. ID/Index. Php/Nusantara/Article/View/94

Slavin, 2000). "Application of Behavioristic Learning Theory in the Learning Process"

Http://Jurnal.Um-Tapsel, Ac. Id/Index.Php/Nusantara/Article/View/94