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COGNITIVE VIEW OF LEARNING

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Abstract

Cognitive learning theory is one of the popular learning theories and has developed rapidly in the world of science, especially in the fields of education, psychology and medicine. This theory emerged as an answer to the dissatisfaction felt by many experts against the previous theory, namely the behavioristic theory. Cognitive theory emphasizes the mental processes that underlie the processing of new information, such as paying attention to an explanation, interpreting an image or associating a new concept with pre-existing knowledge. Cognitive theory defines learning as a relatively long-lasting change in an individual's mental structure that occurs as a result of the individual's interaction with the environment.

Keywords– Cognitive theory, Cognitive, Learning Theory.

1. Introduction

Cognitive learning theory arises because many experts are not satisfied with the behavioristic theory. According to behavioristic theory, learning is a change in behavior. A new person is considered to be learning if he shows a change in his behavior, whereas if there is no change in behavior then the person has not been considered learning. This theory assumes that humans are passive learners so that humans cannot control and determine their own development.

The emergence of cognitive theory is a manifestation of criticism of behavioristic theory which is considered too simple and difficult to account for psychologically. Behavioristic theory is not able to explain how the learning process can occur, and on the contrary according to cognitive theory there is a process that occurs when a person learns and that process is called a cognitive process. According to Wittrock and Lumsdaine (in Haps, 1985) when a person learns, he will utilize cognitive processes, knowledge, interests, and abilities to transform stimuli into meaningful information.

2. Method

The method used in this research is literature study. Literature study is a systematic method of collecting and compiling data obtained from various studies that have been carried out previously (Tranfield et al, 2003). Literature studies provide a comprehensive overview of the literature on a theory, theme or method (Paul and Criado, 2020). A well-conducted literature study will produce a stronger scientific foundation and can facilitate development (Webster and Watson, 2002). By combining findings and perspectives from various studies, literature studies can answer research questions that may not be possible if we use other research methods (Snyder, 2019).

3. Result and Discussion

a. Definition of Learning According to Cognitive View

Cognitive processes are closely related to thinking processes that occur in the brain and this process is one of the highest functions that can be performed by

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the human brain (Alahmad, 2020). Moreno (2010) explains that cognitive theory is characterized by a focus on changes in thinking that occur in the learning process. This view emphasizes the mental processes that underlie the processing of new information, such as paying attention to an explanation, interpreting an image or associating a new concept with pre-existing knowledge. Cognitive theory defines learning as a relatively long-lasting change in an individual's mental structure that occurs as a result of the individual's interaction with the environment.

In contrast to the behavioral theory which believes that the learning process is a relationship between stimulus and response, cognitive theory argues that the learning process occurs in the individual's mind and behavior is a manifestation of changes in the individual's mental structure. According to cognitive theory, behavior change is not too important. For example, when students cannot explain the difference between mammals and other animals. Although he had seen animals that included mammals such as cats and dogs, he did not know that these two animals were mammals. The teacher then explained to him about mammals so that there was a change in the mental structure in his brain but there was no change in behavior. Behavioral changes only occur when he is asked to explain what a mammal is.

b. Information Processing Model

Information processing model is a model that describes how individuals obtain new information, store information and retrieve that information. This model has long been used by cognitive scientists to explain cognition and the learning process.

1) Sensory Memory

Sensory memory is the first system associated with the external environment. Sensory memory relates to all the senses that exist in humans, such as the senses of sight, hearing, touch, smell and taste. This memory captures all information received by the senses and stores the information briefly until it can be processed further and will later be passed on to short-term memory.

2) Working Memory

Working memory is the second system after sensory memory in the information processing model. Working memory serves to give meaning to new information received by sensory memory. This new information is received by the working memory from two directions. The first is new information that comes through sensory memory and the second comes from old information that is in long-term memory which is retrieved and stored again in working memory for further processing.

At first, cognitive experts believed that working memory only played a role in temporary storage of new information, so it was called short-term memory. However, modern theory prefers the term working memory because based on recent research it was found that in addition to storing new information, this memory system is also equipped with an executive center that can "work" with temporarily stored information. Components that work to "work" with retained information.

Working memory has 3 components, namely the visuospatial skeychpad (VSSP), the phonological loop (PL) and the center executive (CE). VSSP functions to store visual and spatial information for further processing, OT functions to store information in the form of words and sounds for further processing, while CE plays a role to focus attention, organize new information, integrate new information with previous knowledge, and control tasks. -complex voluntary tasks, and discourage inappropriate thoughts and actions.

3) Long Term Memory (Long Term Memory)

Long-term memory is the third system in the information processing model. Long-term memory can store very large amounts of information and for an indefinite period of time. This memory system can be likened to a library that can accommodate millions of book titles, long-term memory can accommodate and store millions of information that can be recalled or retrieved by short-term memory to be used as a reference if needed.

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c. Diversity in Information Processing

The information processing model that we have studied previously is a universal model that describes cognitive processes in humans. However, as individuals, humans have their own uniqueness that distinguishes themselves from other individuals. This uniqueness is then also seen in the information processing that occurs within each individual.

1) Sensory Memory Diversity

In general, every individual has a sensory register or senses that function normally. However, in this world there are also individuals who have sensory disorders or five senses that do not function normally, such as impaired vision and hearing. When a person cannot make full use of the sensory memory they have, instructions in the impaired sensory modality need to be supplemented by instructions in the undisturbed modality. For example, for deaf students who cannot hear the teacher's explanation, the teacher can use sign language so that students can still understand what is being explained.

2) Diversity in Focusing

Students also have different abilities in focusing attention. Students who have low learning abilities tend to find it difficult to ignore the distractions that exist while studying. The same thing happened to students with ADHD and mental retardation. In order for the learning process to be optimal, teachers who teach these special children must be able to maintain conditions and a conducive learning environment so that children can stay focused and not be distracted by other irrelevant stimuli.

3) Diversity of Working Memory

This difference in working memory can occur due to age, where children still have a small capacity in their working memory when compared to adults. Students who have learning difficulties also tend to have a smaller working memory capacity than students who do not have learning problems. In addition, gender differences also indicate differences in working memory. Men tend to have good working memory in VVSP

aspects such as the ability to read maps and other visual-spatial intelligences, while women have better intelligence in OT aspects, such as the ability to speak and assemble words.

4) Long-term Memory Diversity

All information known by students or commonly referred to as prior knowledge greatly affects student learning abilities at this time. Students who are already in the world of music and even take music courses will understand it very easily when the teacher first explains about music in class. However, for students who do not know anything about music at all, they will find it difficult to understand the teacher's explanation. So all knowledge stored in students' long-term memory will greatly affect the current learning process.

d. Complexity of Cognitive Process

Cognitive processes are very complex or complicated processes. In this complex cognitive process, we must use or transform the knowledge and skills we already have (Moreno, 2010). For example, when students use their pre-existing knowledge and skills to solve a problem, to think critically about certain issues or to work creatively.

In this discussion we will explain about cognitive processes that are more complex, more complicated than simply remembering new information. Starting from a discussion of concepts that are considered by experts as the smallest unit of the human mind, how these concepts can be understood and formed in the mind, as well as various thinking processes that we can do on a daily basis such as reasoning, creative thinking, decision making, critical thinking and metacognition and learning strategies.

e. Concept Formation

The concept if interpreted simply can be interpreted as a category or term used to group several things together (Moreno, 2010). Concepts are abstractions formed by generalizing specific things or terms used to describe abstractly an object, event, situation or group.

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The main use of this concept is to make it easier for us to organize an infinite amount of information, make it easier for humans to communicate (Santrock, 2011), help us to connect with the world more quickly (Long et al, 2011). In addition, according to Hamalik (2004) the concept can also help us to identify objects that are around, help us in learning something new with a wider and more advanced, directing instrumental activities, enabling the implementation of teaching and concepts can be used to learn two things. different things in the same class.

We can use the concept of "chair" to describe all objects that can be used to sit or the concept of "emotion" to describe everything that we can feel such as anger, sadness, joy, fear, anxiety, happiness, etc. This concept is very important and fundamental in every thought process carried out by humans so that many experts consider the concept as the smallest unit of thought.

1) Concept Formation Theory

The formation of this concept is a process that occurs throughout our lives, which can occur through direct experience when we are dealing with the environment, with the media (TV, newspapers, radio, internet, etc.) or when we interact with other people (Moreno, 2010). There are several theories that explain how the process of concept formation occurs in our minds, namely rule theory, prototype theory and example theory.

According to rule theory, a concept can be formed in our minds through certain pre-agreed rules. For example, to understand the concept of "mammals" students can be given information about the characteristics of mammals, what distinguishes them from other animals. Meanwhile, according to prototype theory, a concept can be formed by presenting a prototype or the best representative that can describe a category. For example, to understand the concept of birds, we take pigeons as the prototype because pigeons have all the characteristics possessed by birds, such as feathers, lay eggs, have a beak and have the ability to fly. So we can use pigeons as prototypes to explain the concept of birds to students.

The third theory is the theory of examples. This theory can be used to assist students in understanding abstract concepts such as the concept of "learning". If we explain to students that learning is an effort made to acquire new knowledge, many of them may feel confused. But when we explain with examples, for example, learning is an activity of reading books, listening to the teacher explain the material at school, most likely all students will understand well.

2) Strategies to help students understand new concepts

So important is the position of concepts in cognitive processes that it is very important for teachers to know and understand the right ways to help students form concepts (Moreno, 2010). So that the learning process can take place optimally so that students can really understand a concept being studied, the teacher can use several strategies as follows:

a) For example, when discussing the concept of a hobby. Before going to the core of the lesson, the teacher asked the students what things they liked the most or if they liked reading.
b) Show students examples, which are examples of hobbies and which are not.
c) Help students to identify the attributes that match the concept. For example, by asking what are the characteristics of a hobby.
d) Explain to students that the name of the concept is hobby.
e) Explain the meaning of the hobby concept in a language that students can understand.
f) Teachers can use visual media to increase students' understanding.

3) Misconception

Misconception is an understanding of the concept that is wrong or contrary to the concept that should be (Dole & Sinatra in Moreno, 2010). This misconception occurs because of misinformation received by individuals. For example, many people think that tomatoes are vegetables, but actually tomatoes are scientifically included in the fruit category. This misunderstanding often occurs because we often see many people who use tomatoes in cooking and even

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in supermarkets, tomatoes are arranged on vegetable shelves. This erroneous information then creates a misconception about tomatoes.

f. Thinking

Thinking is the process of manipulating and transforming the information in our working memory (Moreno, 2010). Thinking can also be interpreted as an activity that involves the use of concepts and symbols as a substitute for objects and events (Musen & Rosenzweig in Rakhmat, 2008). As we have learned previously, the information processing model which consists of many processes such as receiving information, encoding, organizing, storing and recalling information is part of thinking. All of these are processes that humans consciously carry out to manipulate and transform information, but are still in a simple stage. In this discussion we will examine more complex or more complicated thought processes such as reasoning, decision making, creative thinking, metacognition and critical thinking.

1) Reasoning

Reasoning is the process of drawing logical conclusions based on the facts (Sternberg & Ben Zeev in Moreno, 2010). This reasoning is divided into two, namely deductive reasoning and inductive reasoning. Deductive reasoning is drawing specific conclusions from general statements. For example, when students learn the formula for calculating the area of a square, then students apply the formula to calculate the area of the class.

While inductive reasoning is making general conclusions from specific events. For example, during class time, student A is busy chatting with his friends, but teacher B does not reprimand him. The next day he repeated the same thing and teacher B still didn't reprimand him so he concluded that it was okay to talk in class while teacher B was teaching, when in fact teacher B was having problems at home, his son had been sick for two days so he couldn't concentration while teaching because his mind is divided.

2) Decision making

Decision making is a process of making choices after evaluating several existing options (Moreno, 2010). As adults, we often make decisions in life, whether it's related to professional life or everyday life at home. A classic study even shows, a teacher can make 800 decisions a day, including when answering questions from students. This decision-making process often feels difficult for some people, because there are many things to think about when making a decision.

There are three general characteristics of the decision-making process (Rakhmat, 2008) namely the decision is the result of thinking, the result of intellectual effort; decisions always involve the choice of various alternatives; decisions always involve concrete actions, although their implementation may be delayed or forgotten. Furthermore, Rakhmat (2008) also explained that there are three main factors that influence the decision-making process in individuals, namely cognition or the quality and quantity of knowledge possessed, motives and attitudes.

This decision-making process tends to be closely related to age. As people age, individuals tend to be more capable or more competent in making decisions. Children often have more difficulty making decisions than teenagers. In addition, the time needed by teenagers to make a decision is also more efficient than children. This happens because the cognitive process in adolescents is more developed, they have gotten more information from the family, friends, school and media. In addition, teenagers have also experienced many things and experiences that can be their provision when faced with difficult choices.

Teachers can also improve students' ability to make decisions, for example by knowing how the thinking process occurs in students, whether they have considered the consequences of each choice, whether they have avoided thinking mistakes when making decisions.

3) Creative thinking

Creative thinking occurs when we try to come up with new ideas, combine several ideas in new ways or when we try to solve a problem in a

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unique way, which was not thought of before (Moreno, 2010). So far, the word creative is often associated with the world of art, but it turns out that creative values are also very important in the world of education. Creativity is a cognitive activity that produces a new view of a form of problem and is not limited to pragmatic results (Solso et al, 2008).

According to Mc Kinnon (in Rakhmat, 2008) creative thinking must meet three requirements. First, creative thinking must involve new responses, ideas or ideas (statistically rare), creative thinking must also be able to solve existing problems by offering realistic alternative solutions so that they can be applied in human life, and creativity is an attempt to maintain insight or original insights, then assess and develop those insights to the best of their ability.

There are four stages that are passed in the creative thinking process as proposed by Wallas and Patrick (Hamalik, 2004) namely the preparation, incubation, illumination and verification stages. In the preparation stage, we will receive and review new information that is relevant to the problem. Then at the incubation stage, the mind will rest for a while but the problem-solving process continues in our subconscious soul (Rakhmat, 2008). At the illumination stage, there is a clear conception of the solution to the problem, we manage to gain new insights that can be used to solve the current problem. The last is the verification stage, at this stage we reassess whether the insights we have obtained are indeed appropriate and appropriate to use.

Based on empirical research, the ability to think creatively is very difficult to develop through a self-taught learning process, only certain individuals are able to develop self-taught creative thinking skills such as Einstein, Picasso and Mozzart. Hayes (in Solso et al, 2008) explains that creative thinking can be trained and developed in several ways, such as developing basic knowledge, creating the right atmosphere for creativity and looking for analogies. According to the intelligence triarchy theory, in the learning process there must be activities that can stimulate students'

creativity, which can encourage students to think creatively because creativity can affect student achievement in school and other achievements in life.

4) Metacognition and Learning Strategies

Metacognition is a complex cognitive process because we must be very aware of what we know, and when and how we apply different strategies to achieve the learning goals we are living (Moreno, 2010).

A junior high school student named Yana will take the Japanese exam next week trying her best to repeat the subject matter so that she can do well on the exam. He felt quite familiar with the grammar, but there are some vocabulary that is still difficult to remember, as well as the writing in kanji. To help him memorize, he wrote down the vocabulary on a blank paper and decorated it with bright colors and letters. The paper that already contained the vocabulary was then photographed and made into his cellphone wallpaper so that every time he opened his cellphone he would read the words.

Yana's strategy is a very good example of her metacognition. He is aware of his strengths and weaknesses in learning Japanese, he is able to apply strategies to overcome his weaknesses so that his goal of getting good grades can be achieved. Metacognition is very closely related to learning strategies, because this strategy is the estuary or end of the metacognition process carried out by students.

There are several other ways that students can use to improve their understanding of the material being studied in class, namely by taking notes, making conclusions and the SQ4R (survey, question, read, recite and review) method, which is a method for understanding text or readings.

5) Critical thinking

Critical thinking is a systematic process to examine available information which then produces conclusions based on existing facts (Moreno, 2010). Although until now there is still often a debate between opinions stating that it would be better if students were taught how to think

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rather than teaching what to think, many educators feel that the ability to think critically should be taught to students because critical thinking is important to help students. achieve success in society.

The ability to think critically must be taught from childhood because it will affect adolescence and adulthood. Children who are not trained to think critically, for example through mathematics and literacy training, tend to grow up to be teenagers who are not able to think critically (Santrock, 2011). Especially in this era of digitalization, where students can easily and quickly access all the information on the internet via cell phones. They are exposed to various information that is not necessarily true, maybe even a hoax, so it is very important for students to be able to think critically. In fact, elementary school students can already be taught to think critically, for example by frequently asking questions that can stimulate them to think critically, create a safe and comfortable learning atmosphere, teach students to accept differences of opinion, etc.

4. Conclusion

Cognitive processes are closely related to thinking processes that occur in the brain and this process is one of the highest functions that can be performed by the human brain (Alahmad, 2020). Moreno (2010) explains that cognitive theory is characterized by a focus on changes in thinking that occur in the learning process. This view emphasizes the mental processes that underlie the processing of new information, such as paying attention to an explanation, interpreting an image or associating a new concept with pre-existing knowledge. Cognitive theory defines learning as a relatively long-lasting change in an individual's mental structure that occurs as a result of the individual's interaction with the environment.

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behavior change is not too important. For example, when students cannot explain the difference between mammals and other animals. Although he had seen animals that included mammals such as cats and dogs, he did not know that these two animals were mammals. The teacher then explained to him about mammals so that there was a change in the mental structure in his brain but there was no change in behavior. Behavioral changes only occur when he is asked to explain what a mammal is.

Cognitive processes are very complex or complicated processes. In this complex cognitive process we must use or transform the knowledge and skills we already have. The complexity of this cognitive process has a smallest unit known as a concept. The concept if interpreted simply can be interpreted as a category or term used to group several things together. There are three theories that can explain the formation of concepts in our minds, namely rule theory, prototype theory and example theory.

Moving on from the concept, there is a thought process. Thinking is the process of manipulating and transforming the information in our working memory. There are several types of thinking processes that we can do on a daily basis such as reasoning, creative thinking, decision making, critical thinking and metacognition and learning strategies. All these types of thinking can be taught to students, even many educators already understand that students should be taught and trained to think, how to think and how to develop thinking skills so that students can more easily understand information and knowledge, analyze, evaluate and be able to create something useful from the information and knowledge it has.

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