INFORMATION PROCESSING AND COGNITIVE THEORIES OF LEARNING

Brayadi, Supriadi, Hecksa Manora

STAI Bumi Silampari Lubuklinggau, Indonesia
adi676720@gmail.com; supriadispmm80@gmail.com; manorahecksa@gmail.com

Abstract

Article History	*Gagne suggests in his theory that cognitive learning outcomes are the result of this learning pattern, namely intelligence which includes oral and written skills, the ability or capacity of each individual, long-term planning that has goals, and motor skills. Learning theories are learning theories that we can take from anywhere that is owned by cognitive learning experts, namely the thoughts of experts, habits, empirical research and the theory of learning itself. Cognitive learning is learning that refers to activities or activities that include various activities related to the learning process and information development to increase the quality according to the capacity of students through this method can improve the learning process of students who focus on the process of cognitive learning models.*
Received : 12-01-2021	
Revised : 25-01-2021	
Accepted : 29-01-2021	
Keywords :	
Gagne's Theory	
Learning Information	

Preliminary

Today's learning theory is a very important need in our lives, because without a learning theory we will never know the learning formulas that we must learn in the procedure for studying science, it is inseparable from one of the theories that we must learn in learning. understand the theory of learning, namely the theory of cognitive processing. The theory itself can be obtained from anywhere that has accurate sources (a) from the thoughts of experts (b) habits (c) empirical research (d) learning theories themselves.

This learning theory is also a set of programs as concepts and has been proven by experience and research results in explaining and providing solutions in solving problems in the learning and teaching process. In addition, learning theory is incomplete if we do not use a theory that is very popular in the world of educational psychology, namely cognitive processing theory, this theory is a development of self-confidence that aims to contribute to the study of cognitive development according to Jean Piaget who considers that processing theory is the result of formation of biological adjustments.

Information processing/cognitive theory was pioneered by Robert Gagne (1985). The assumption is that learning is a very important factor in development.

Learning is the output of information processing in the form of human skills (Rehalat 2014, 5). This learning pattern focuses on the process of improving the learning process in each student's learning activities that focus on the process of cognitive learning models. There is a way to unite every input or direction received from the environment and then collect it into one, then examine each problem and solve it and then determine the design.

Research Methodology

This study uses a qualitative research approach. The data sources are obtained from supporting literature such as journals, books, and other information. The study used is library research. The research begins by collecting research materials and then analyzing them using existing empirical information. Then began this research.

The data analysis technique is carried out by first collecting data and then reducing it, then after being reduced, the data display is presented and then analyzed using a theoretical approach or existing sources and then interpreted to draw a conclusion.

Discussion

According to Gagne's Theory, learning outcomes are the output of Information processing in the form of human capabilities, which consist of: Verbal Information, Intellectual Skills, Cognitive Strategies, Attitudes and Motor Skills." The assumption is that learning is a very important factor in development. Learning is the output of information processing in the form of human skills. Long-term memory is the content of images that exist in every kind of pattern that can give birth to several opinions or theories. The description of the theory above can be related to teaching and learning activities that aim at using methods that are very important in success in accordance with the pattern of methods that we can use. learn in the teaching and learning process.

And learning is the result of every process that goes through in teaching and learning activities that involve students so that each theory explained can be understood by students in the teacher's explanation, through this theory the teacher explains various ways we can describe the process of developing teaching and learning patterns by Therefore, it is very important that we apply this theory to every student so that they can understand the pattern of learning by thinking.

Information processing refers to the ways in which people deal with environmental stimuli, organize data, see problems, develop concepts, and solve problems using verbal and non-verbal symbols. Each information process has its own procedures for dealing with everything that happens in the environment by regulating everyone in the environment to know everyone in the environment to see every problem and develop ideas to solve problems using rules. separately must be obeyed such as disciplinary regulations in every educational institution.

And this information processing itself emphasizes us to be able to think again productively, while the other explanation emphasizes the plans developed for each standard provision in every development of the learning process, namely that a student must go through various processes that have quality in each student's thinking, Cognitive theory is a process that results from biological adjustment. The formation of this cognitive theory from a cognitive strategy that

focuses on the mindset of students internally. Information processing theory / cognitive pioneered by Robert Gagne The assumption is that learning is a very important factor in development. Learning is the output of information processing in the form of human skills (Surya 2013, 147).

Therefore the importance of cognitive development for students so that a good and efficient learning process can be formed by introducing the adaptation of the surrounding environment so that it can focus on behavioral and social patterns. Adaptation is a key concept in the two versions of systems theory both biologically, behaviorally and socially proposed by John Bennett, where there are two evolutions which focus on feedback from environmental interactions, and adaptation which focuses on adaptation of organisms during their lifetime, in which organisms It controls environmental factors, not only environmental feedback factors, but also cognitive and continuous movement levels (Bennett 1976, 249–50).

Understanding Cognitive Theory

The definition of "cognitive" comes from the word "cognition" which has the same thing as "knowing" which means knowing. In a broad sense, cognition is the arrangement, use of knowledge (Syah 2017, 65). This opinion aims to prioritize learning patterns rather than the quality or ability of children who use adaptation to the learning environment and the demands of the environment itself consist of two things, namely assimilation and accommodation where assimilation itself is a process of habituation. This is also very supportive of cognitive theory. because this cognitive theory itself is a learning theory that puts forward the process of learning so that teachers can examine each student taught by the teacher. While the accommodation itself is a supporting material for teachers to become mentors in the process of paying attention to each student's behavior.

In order to form character education in students, teachers must be able to cultivate discipline in these students, especially those related to self-discipline (Mulyasa 2014, 71–74). Teachers must master and be able to guide students in improving their learning patterns as well as the attitudes of the students' behavior, implementing discipline in accordance with regulations and also increasing the standardization of student behavior in the learning process, and fostering a sense of care for discipline so that by inviting students to instill this sense of discipline can be able to improve their learning patterns to increase so that they do not hinder the learning process itself, in the supervision of students the teacher must know every behavior that students have so that the teacher can convey any ideas or material that can be easily understood by students so that it does not hinder each process. teaching and learning the same as existing rules and standards.

The cognitive development of students must be monitored by every teacher who teaches each learning process itself, must understand every stage that occurs in students and provide learning that is in accordance with the content, methods, in providing learning methods that must meet the standardization with each stage - the stage of development itself.

Adjustment of assimilation and accommodation can be a continuous process, students can continue to develop and add to their knowledge by using this method, therefore increasing mental stability in students is very necessary for a balancing process because without this balancing process students will experience

delays or halting in each process. so that it is not in accordance with the expected target to increase ability in good equilibration so as to be able to receive and absorb every information very well and logically to be accepted.

Understanding Processing Theory

This information processing model is based on cognitive learning theory (Piaget) and is oriented towards the ability of students to process information that can improve their abilities. Information processing refers to collecting or receiving stimuli from the environment, organizing data, solving problems, finding concepts, and using verbal and visual symbols. Cognitive science is the study of human intelligence, computer programs, and abstract theory with an emphasis on intelligent behavior, such as computation (Simon & Kaplan, 1989). Information processing theory / cognitive pioneered by Robert Gagne (1985). The assumption is that learning is a very important factor in development. Learning is the output of information processing in the form of human skills (Rehalat 2014, 5).

The learning model leads to each student and then is directed to increase the abilities possessed by the students themselves through the stimuli or directions given by the teacher in providing learning material, as well as the environment that provides learning through the experience of each student in the process of knowing how real life is in order to make a good contribution in society so that they are able to solve problems, apply concepts that are in accordance with applicable regulations.

So the purpose of Jean Piaget's theory is research on the origin of thought or ratio in the development of every process of change that occurs in every child who is in the process of every child from early childhood to adulthood. Therefore, the mental development of children occurs gradually. His opinion is that the teaching and learning process is a very important role for children in developing. The learning process is also a process for each child in obtaining information in the form of human communication. In addition, a strong memory can increase the memory power of each child in absorbing material in the form of images obtained by children in various patterns that can produce several opinions.

Cognitive Changes in Children

According to Piaget, cognitive development is one aspect of mental development that aims to: 1) separate reality from fantasy, 2) explore reality and find its laws, 3) choose facts that are useful for life, 4) determine the reality that is useful for life. actually behind something that looks (Surya 2013, 143).

In practice, cognitive development in children can be seen when children can distinguish fantasy images from real ones, so that students have a rational mindset in thinking. Exploring reality and its laws is being able to understand every thought in every material presented by each teacher. Determining something that is real that has good use is to be able to understand every goal and desire that must be achieved to match what students want so that it is useful for living beings. Giving a real picture that is seen is being able to solve problems in every problem

that occurs and be able to determine and decide on a solution in every problem faced by thinking.

The process of cognitive development aims at which every child must go through various processes that are in accordance with the quality of each child's mindset that is adjusted to two processes, namely Adaptation and Organization. Information processing/cognitive theory was pioneered by Robert Gagne. The assumption is that learning is a very important factor in development. Learning is the output of information processing in the form of human skills (Surya 2013, 147).

Therefore the importance of cognitive development for students so that a good and efficient learning process can be formed by introducing the adaptation of the surrounding environment so that it can focus on behavioral and social patterns. Every child must know the environment around them so that they can understand every process that occurs in their environment, it is also a benchmark for every teacher to see the development of each student's behavior at every

Adaptation is a key concept in the two versions of systems theory both biologically, behaviorally and socially proposed by John Bennett, where there are two evolutions which focus on feedback from environmental interactions, and adaptation which focuses on adaptation of organisms during their lifetime, in which organisms It controls environmental factors, not only environmental feedback factors, but also cognitive and continuous movement levels (Bennett 1976, 249–50).

In contrast to Piaget, Burner sees human cognitive development as related to culture. For Bruner, a person's cognitive development is strongly influenced by the cultural environment, especially the language that is usually used. Thus, language development has a major influence on cognitive development (Hartanto et al. 2011, 386–90).

Cognitive development according to Burner is more directed at humans related to the environment which is influenced by the cultural environment which is more leading to the development of language commonly used in everyday life, language is a human ability given by God to humans that is used to communicate, Because language is the result of a mindset developed by humans so that it can develop the cognitive processes contained in students to emphasize their intelligence more than relying on their behavior.

Cognitive development for children is very important, teaching something to children does not have to wait for the child to reach significant stages of development, we should have to prepare for the development of the child itself. , cognitive development in each child can be developed with new ideas to provide new innovations that must be applied to be studied by students and then presented according to the abilities of each level of ability of these students.

Cognitive Theory on Cognitive Learning Process

The essence of learning according to cognitive theory is explained as a learning activity related to the arrangement of information, perpetual reorganization and internal processes. Learning activities that favor cognitive learning theory have been widely used (Syah 2017, 109).

To determine the process and goals in implementing strategies aimed at the learning process. Learning is an activity carried out by involving two or more people consisting of teachers and students, this learning activity is also directly related to the material and the arrangement of the learning pattern itself related to the arrangement of information, with the environment, lifestyle and internal processes, Some of these aspects must be applied in the learning process because it is closely related to the mindset or intelligence of each child in applying in every application of materials in everyday life, by involving students to improve the quality of students.

While the principles of students include: First, students are children who are developing and are not the same as adults who are easy in the thought process, so they really need guidance for any improvement in the cognitive learning process. Second, preschool students and elementary school children will more easily accept the learning process by listening, especially by telling stories. Third, student activity is very important in the involvement of students in the process of assimilation and accommodation that can support the experience and knowledge of students. Fourth, increase the love of children so that it creates a special attraction for students and adds new information in accordance with the guidelines of this theory. Fifth, student understanding will be easier if conveyed using logic from easy to more detailed. Sixth, the learning process using the memorization method will feel more different and challenging because it uses a method that relies on a strong memory so that the learning pace of children will be more enthusiastic. Seventh, every student has differences, from each individual to the student can be considered through the influence of each student's learning success.

Strengths and Disadvantages of Cognitive learning patterns

Learning theory must have positive and negative effects that affect the results of the learning process as well as cognitive theory has positive and negative effects so that it becomes the teacher's benchmark to be a benchmark in implementing learning.

The advantages of the Cognitive Learning Pattern include cognitive learning, basic material education that is developed and continued by students and the teacher only supervises and explains widely to students who have been given; this cognitive method is a theory that can improve and maximize good memory power in students so that they can more easily understand each lesson material explained by teachers to students through getting used to memorizing, so students or students get used to memorizing; this method is a very good alternative in teaching students because this method can be the latest creation in the world of education by creating every innovation given by teachers to students who are taught to make it easier; This method is not difficult to explain and very easy to accept in various circles because it uses a method that is easy to apply and learn by various groups.Disadvantages of Cognitive Learning Patterns include; this method focuses too much on the memory ability of students and always assumes students have the same memory even though each child does not have the same ability; each student has their own way of understanding the material given by the teacher because this material does not focus on exploiting and developing students in each of their developments; but students do not easily understand every teaching material presented by the teacher if only using this method; if there is no

method for the learning process, students will definitely have difficulty in understanding each of the teaching materials provided; using this method strategy requires students as a forum to improve children's mindsets in developing the discussions they receive.

Learning by using a mindset, making children innovative in understanding the material with easier understanding, this presentation emphasizes the development of knowledge possessed by all students and individually, provides the basics of developing material taught for the development of each student on an ongoing basis, participants students only need to monitor each flow of explanation delivered by the teacher, emphasizing this cognitive theory, it is hoped that students can improve their memory power of reviews of each teaching material presented by the teacher to students and this cognitive method is always applied in Indonesian education in stages.

In every cognitive learning process, each child's intelligence and memory are carried out in each student, therefore children have the same abilities in every weakness found in the students being taught, this is an effective way for children to develop knowledge in the ways they like. understand what is in each student.

The implementation of cognitive theory in each child will be easier to understand because this theory always emphasizes students in every activity by relying on the intelligence and memory of students in every learning process, therefore this theory is a theory that is often used by every teacher. or teachers to each student to apply the learning process in order to develop the intelligence that exists in each student.

Effect of Cognitive Processing

In addition to cognitive factors, age also affects a person's ability to absorb information. This is in accordance with the opinion of Kuhn and Siegler (2006) that children's cognitive development continues to experience changes and increase in more complex knowledge. Children aged 5 years have different concepts related to certain things compared to children aged 12 years. It shows a pattern of cognitive changes in children during their lifetime. In other words, the more children grow into adults, the more complex the growth of brain cells that help in processing information. In addition, the more experience they have, the faster the child will process information (Prima 2016, 229).

Cognitive theory is a theory that has a great influence on changes at every level that exists at the age of every child from 5 to 12 years, it is something that shows a pattern of changes in the child's mindset or cognitive that occurs in every child. in every process of child development itself.

It can also be described in other words, namely that the growth and development of children is a process of child development, it is determined by the growth of each child who can change each child's mindset in every process that occurs in students by showing a more complex mindset that is in accordance with cell processes. the child's brain that can help every process of the development of the students themselves.

From the results of research conducted by Kuhn and Siegler (2006) showed that the learning process can occur before the baby is born and there are differences in the development of cognitive capacity between babies born

normally and premature babies. Babies born will get new experiences from the surrounding environment which is important in the learning process so that it affects the increase in cognitive capacity. With the stimulus and support from the environment, the development of a person's cognitive capacity increases. A good learning system pays attention to the presence of a stimulus to facilitate one's thinking and learning processes and is supported by a conducive environment.

Conclusion

Information processing theory is information that relies on a strong memory. Students are caused by several factors that influence it, each student has different and varied abilities in students, for that reason, supervisors are needed, namely teachers consisting of teachers, mentors and coaches to control the information they get so that they produce an understanding. strong and appropriate so that there is no miscommunication between teaching staff and being taught, because this theory has a major influence on the intelligence of students it is a point of success from a teacher to students in processing and understanding every stimulus or direction to students so that they can be accepted and increase his interest.

It can be concluded that based on the explanation above, learning will be successful if it is in accordance with the stages and provisions that exist in each character of cognitive learning patterns in students. Every educator / teacher must always provide a place to explore in developing their abilities so that they can develop even more rapidly.

As stated in the Qur'an verse 13 Surah Al-Hujurat:

$$\text{يَٰٓأَيُّهَا ٱلنَّاسُ إِنَّا خَلَقْنَٰكُم مِّن ذَكَرٍ وَأُنثَىٰ وَجَعَلْنَٰكُمْ شُعُوبًا وَقَبَآئِلَ لِتَعَارَفُوٓا۟ إِنَّ}$$
$$\text{أَكْرَمَكُمْ عِندَ ٱللَّهِ أَتْقَىٰكُمْ إِنَّ ٱللَّهَ عَلِيمٌ خَبِيرٌ}$$

"O mankind, indeed We created you from a male and a female and made you into nations and tribes so that you may know one another. Verily, the most honorable of you in the sight of Allah is the most pious among you. Verily, Allah is All-Knowing, All-Knowing."

The explanation of God's word above provides a lot of understanding and understanding of human characteristics which are essentially different, the differences in each character and characteristics are also seen in the world of education, especially in every process of development of an intelligence process in each student.

REFERENCES

Bennett, John W. 1976. "The Ecological Transition - 1st Edition." https://www.elsevier.com/books/the-ecological-transition/bennett/978-0-08-017867-7 (February 25, 2022).

Hartanto, Fitri, Hendriani Selina, Zuhriah H, and Saldi Fitra. 2011. "Pengaruh Perkembangan Bahasa Terhadap Perkembangan Kognitif Anak Usia 1-3 Tahun." *Sari Pediatri* 12: 386–90.

Mulyasa, H. E. 2014. *Pengembangan dan Implementasi Kurikulum 2013*. Bandung: Remaja Rosdakarya. https://opac.perpusnas.go.id/DetailOpac.aspx?id=873211 (February 25, 2022).

Prima, Ellen. 2016. "COGNITIVE SCIENCE DAN COGNITIVE DEVELOPMENT DALAM PEMROSESAN INFORMASI (INFORMATION PROCESSING) PADAANAK." *KOMUNIKA: Jurnal Dakwah dan Komunikasi* 10(2): 219–30.

Rehalat, Aminah. 2014. "Model Pembelajaran Pemrosesan Informasi." *Jurnal Pendidikan Ilmu Sosial* Volume 23, No. 2,.

Surya, Mohamad. 2013. *Psikologi guru: konsep dan aplikasi*. Alfabeta. https://opac.perpusnas.go.id/DetailOpac.aspx?id=896137 (February 25, 2022).

Syah, Muhibbin. 2017. *Psikologi Belajar*. Rajawali Pers. https://opac.perpusnas.go.id/DetailOpac.aspx?id=1137520 (February 25, 2022).