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THE THEORETICAL BASIS AND TEACHING VIEW OF CONSTRUCTIVISM

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Abstract:

On the basis of the theory of philosophy and cognitive psychology, constructivism has given the views on knowledge, on learning and on teaching. Accordingly, teaching must be a process where teachers and students jointly create an environment to motivate students to actively create knowledge and feel the meaning of that construction.

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THUYẾT KIẾN TẠO: CƠ SỞ LÍ LUẬN VÀ QUAN ĐIỂM DẠY HỌC

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Tóm tắt

Trên cơ sở lí luận của triết học và tâm lí học nhận thức, thuyết kiến tạo đã đưa ra những quan điểm về tri thức, về học tập và về dạy học. Theo đó, dạy học phải là quá trình mà giáo viên và người học cùng tạo ra môi trường để thúc đẩy người học chủ động kiến tạo tri thức và cảm nhận được ý nghĩa của việc kiến tạo ấy.

A. Introduction

Entering the 21st century, due to the stormy development of science and technology, humanity is facing new challenges coming from the knowledge economy, the information age and the knowledge society. In order to better understand learning, knowledge and teaching, we find it necessary to introduce some brief features of constructivism and its practice in Vietnam, especially at the present time, when we admit that the Flipped classroom model is an effective model to train and develop self-study skills for learners on the one hand, on the other hand, online teaching and learning must be applied due to the Covid-19 pandamic.

B. Content

1. Theoretical Basis of constructivism

1.1. Philosophical Basis

As early as 1725, the Italian philosopher G. B. Vico in his book titled "New Science" contained the educational philosophy of constructivism. Vico put forward the principle *"Truth is creation"*, as he believed that *we could only understand most clearly what we ourselves created.* Vico explained that in addition to abstract thinking, humans also had the ability to imagine and imagination was the source of human's creativity and practical wisdom. Myths and epics were the clearest evidence in which the primitive wisdom of mankind was expressed and he called it "*poetic wisdom*" (Sapicnzapotica). [4]

At the end of the 18th century, the German philosopher and astronomer I. Kant really changed the epistemology of mankind. He proposed the principle that *"the subject is the center of the cognitive process"* and said that the objectivity of knowledge did not originate from the perceived object but from the perceiving subject itself; cognitive activity was mainly the process of creating time, space and categories of the subject for the object.

The theory of learning developed by the American philosopher-educationist J. Dewey also had a certain influence on the formation and development of constructivism. His three main views include: education is life, education is development, and education is the continual reform and reorganization of experience. Accordingly, learning must be an active process to achieve the best effect. [5] Learning is always associated with exploration and discovery in an environment containing many unknown factors. And it is these factors that will stimulate positivity, active exploration and discovery in learners.

It is clear that, although the above theories may not be exactly the same, in terms of epistemology, both psychology and philosophy emphasize

the active constructive role of the subject in the cognitive process. For example, Kant's epistemology only emphasises the process of construction of the subject to the object, ignoring the process of construction of the object to the subject. This makes it a one-way construction process. On the other hand, Piaget believes that the cognitive process is a two-dimensional construction process. Kant also argues that the innate cognitive structure is already there. "It is this view that has greatly influenced the thought of later subjective constructivism." [2]

1.2. Psychological Baisis

The idea of constructivism originated from Cognitive Theory, first proposed by J.W.F. Piaget, and then further developed and perfected by J. Bruner and L. Vygotsky making it a widely applied theory in education today.

As a representative of structural theory in cognitive psychology, Piaget mainly focused on the problem of the origin of knowledge structure. According to Piaget, *cognitive structure was the totality of existing concepts and ways of organizing them in the human brain*. He believed that, from the moment of birth, humans had participated in the creation of the world around them. Perception came from action. Action was both the source of sences and the basis of thinking. Piaget always emphasized the interaction relationship between subject and object in cognitive activities. He believed that learning was a cognitive process and the learning was the process in which learners found a balance between existing knowledge and new knowledge.That was the adaptation that took place in cognitive structures, including two processes: assimilation and accommodation. Assimilation was the process by which learners applied old knowledge to solve new problems and organize newly acquired knowledge into existing knowledge structures. Accomodation was the process by which learners changed the existing structure, created a new structure to adapt to the diverse requirements of social environment. In these two processes, learners needed to realize for themselves the true meaning of changing cognitive structures and the great benefits that the learning process brought. [11] In education, these two concepts posed very basic problems, *i.e. how should the teaching process be conducted so that learners could change their inherent knowledge structure, create new knowledge, and through which learners perceived the true meaning of learning.*

In his theory of psychological development, Vygotsky first introduced two concepts *"current level"* and *"nearest development zone"* to explain the development process of children. [3] He said that in the process of children's development, there were often two levels: *the current level* and *the nearest development zone*. At *the current level,* the psychological functions had reached maturity, while in *the nearest development zone* the psychological functions were maturing but not yet ripe. In practice, the current level is expressed in the fact that children solve the tasks independently, without any outside help; while the nearest development zone is shown in situations where children can complete the tasks only with the cooperation and help from others. Thus, two levels of children development represent two levels of maturity at different times. At the same time, they are always moving and developing: the nearest development zone today will tomorrow become the current level and a new nearest development zone will appear.

For that reason, *teaching and development must be organically linked together. Teaching must precede the development process, creating the nearest development zone, which is a condition for revealing development*. Only then can the teaching and learning activities be highly effective. This requires teachers to provide initial support to learners, but should not continue to intervene deeply when the learners have had the ability to work independently. Of course, in practice it should be noted that teaching is not too far ahead of development, but teaching must not be behind development. Thus, Vygotsky's theory of the „nearest development zone" clearly shows that *the essence of teaching is not the process of training or strengthening the psychological functions that have been formed in learners, but the process of encouraging them to learn psychological functions that are not yet ripe at the moment, thereby reaching the current level of development.* On the other hand, Vygotsky said that in the learning process, learners always tended to combine existing common sense concepts with new scientific concepts, thereby forming new perceptions.

Bruner is an educator, as well as a cognitive psychologist. He brought applied cognitive perspectives into education. According to him, *the process of information acquisition always has three stages: receiving, transforming and evaluating*. [6] With learners, knowledge is also a type of information. Therefore, in the learning process, learners should not be passive acquirers of knowledge but active information processors. *The main goal of education is to form cognitive methods and skills for learners.*

He stressed that it was very important for learners to know how to study. The purpose of our education was to encourage learners, to make learners fully develop their abilities to explore and discover problems, then enhance motivation and make

learning a fun process. Further more, he emphasized that encouraging learners to discover problems was not for learners to solve problems that others had not discovered, but rather to develop their capacity to explore and discover new things and phenomenas. The process of discovery was the process of constructing knowledge. Learners combined their understanding with the surrounding world environment, thereby feeling the true meaning of acquiring knowledge.

2. Teaching perspective of constructivism

2.1. Perspectives on knowledge

Constructivism holds *that knowledge is not an objectively existing thing but the subject's experiences, explanations and assumptions*. [8] Therefore, knowledge cannot be discovered but can only be invented. For example, we all learn or teach learners that: Newton *discovered* the law of universal gravitation. That is to say, before Newton's discovery, this law had existed objectively in this world, just like coal or oil. It was just found by Newton. In other words, we consider Newton's theory as an already existing thing. In fact, before Newton, only gravity existed, not the law of universal gravitation. So we and our learners need to understand correctly that Newton *invented* the law of universal gravitation. According to constructivism, knowledge is just temporary explanations and assumptions that people make when faced with new things, phenomena, information or problems in real life. The law of universal gravitation is just an explanation or a hypothesis that Newton invented, it has *certain objectivity, relativity, temporality and pragmatism*. The development of human society has proved that all knowledge is not absolute and exists objectively but can change depending on the subject's interpretation, just like Einstein once said: "Everything is relative, including my theory of relativity." We can take the diagnosis and treatment of Western and Eastern medicine as an example for this. When a man has a stomachache, western doctors say he has gastritis and treat it with a prescription for western medicine. But if the man is examined by doctors of oriental medicine, the result will be discord and that stomachache will be treated with traditional medicines. Here, the phenomenon of abdominal pain is an objective existence, but the diagnosises and treatments do not exist objectively but are subjectively created by people. And we can say with certainty that, along with the development of science and technology, mankind will also come up with many other cures. On the other hand, each individual may have different interpretations of the same general knowledge. For example, with the same concept of acid, a chemist and someone who has been splashed with acid will have different interpretations depending on their different subjective understanding and experience.

In short, both the general knowledge of the social community and the individual knowledge is not an objectively existing thing but a temporary explanation and hypothesis. As Vygotsky said, it was only knowledge at the stage of "the nearest development zone". The theoretical view of the constructivism has really changed our view of human knowledge, of the individual role of each cognitive subject, and of teaching and learning. Accordingly, all human knowledge is not an available, complete and completely scientific, objective thing that we just need to accept without explaination. On the contrary, *each individual needs to be active in understanding, explaining and developing knowledge, and at the same time must always create new knowledge*. Realizing this, from organizing training to organizing lectures will have to change fundamentally. The teacher's task is not to read for learners to copy or explain for learners to understand, but to organize for learners to learn, explain or make new assumptions to develop knowledge. Learners' task is not to copy or answer the teacher's questions but to actively analyze, evaluate, explain and make new hypotheses. *The classroom must be a place where teachers and students jointly create knowledge*. After each lecture, both teachers and students get results from that construction process. And so, at least there will be a slight change in the teacher's lesson plan, which is the "additional" section after each lecture, where learners' questions or the knowledge that the teacher has learned or newly discovered teaching methods are recorded.

2.2. Perspectives on learning

Constructivist theory holds that *learning is a process of knowledge construction, the process by which learners use their existing knowledge and experiences to explain new things, phenomena, problems or information in their own ways.* [9] According to previous epistemology, knowledge is an objective existence, independent of the subject's cognitive process. And so, the task of learners is to copy or print that knowledge into their head, like a computer and then take it out to use when needed. Currently, most of learners in Vietnam are still performing learning tasks this way. Teachers read or explain, learners listen, copy, try to understand, and remember the given information. This information will then be retrieved for use during assignments or exams. The knowledge used in the exam should be the same as in books, because this is the knowledge that mankind has discovered, which is objective, absolute and accurate. However, we all know that such a

concept about teaching and learning has in fact stifled all the creativity of learners and teachers. Like Vico said, *even if those knowledges were truth, truth was anyway just a creation, there was no absolute truth.*

On the other hand, constructivism holds that each cognitive subject has different characteristics of physiological structure, different experiences in life and different living environments. Therefore, *each person has a different way of explaining and making different assumptions about the same thing, phenomenon or new problem*. In other words, each person has a different knowledge structure from his own interpretation and speculation. During the learning process, *we must mobilize, synthesize, and restructure, or even change the existing knowledge and experiences to interpret the information we have just received, create our own meaning, or form our own understanding and explaination for yourself*. If the knowledge and experience inherent in each subject is different, surely the interpretation of the information will be different and the meaning or interpretation of it will also be different. A person who has been burned, a firefighter and an ordinary person will have very different feelings and interpretations about "fire". In other words, "fire" has very different meanings to them. That is to say, the meaning of knowledge is not available, but it is created during the construction process of the perceiver. This view actually existed before Piaget as Cognitive Theory had clearly stated when defining cognition: *perception is the result of the interaction between existing knowledge and new knowledge*. If our education system understands that learning is the process of building knowledge on the basis of existing knowledge, how meaningful the learning process will be. "Only when knowledge is relevant and meaningful can it be effectively absorbed and become more meaningful in life." [10] For learners, learning is no longer a passive process of acquiring knowledge from books or teachers, but an autonomous and active process. When encountering a new thing, phenomenon or problem, learners will feel curious, want to discover and solve them. They will activate and associate the knowledge already in mind, mobilize all the ability and creativity to find ways to explain them. On the other hand, autonomy in learning is also reflected in the self-selecting of certain information or information on the basis of one's knowledge structure to interpret them, create their own meaning.

2.3. Perspectives on teaching

According to constructivist theory, knowledge is not a thing, learning is not a process of receiving knowledge such as receiving the movement of an object, and thus, teaching cannot be a process of imparting knowledge just like the movement of an object. *Teaching must be the process of creating an environment to promote learners to actively create knowledge.*

According to traditional concept, teaching is the process of imparting knowledge that has exist objectively in real life or in books to learners through a number of steps such as explaining, practicing, and testing. We consider tests as the best measure to assess the level of knowledge copied from books or the amount of knowledge that learners receive from teachers. At the same time, we assume that the amount of knowledge in learners' head should be the same as that in teachers' head. Opposing this point of view, constructivism holds that *the meaning of knowledge must be constructed by learners and can never be obtained through direct transmission.* [10] Faced with new knowledge, each learner may process them in different ways depending on his/her inherent knowledge, then create them in different forms based on the meaning they perceive. This leads to a radical change in the teaching process and the role of the classroom. Accordingly, *in the process of teaching, teachers must always create a certain environment in which banks can create the meaning of knowledge*. [7] Teachers must always promote that construction process, pay attention to learners' knowledge-building process, and at the same time encourage, help, guide, and suggest for learners to achieve the desired construction purpose. Constructivism emphasizes the importance of activities in the teaching process such as individual activities, group activities, collective activities, etc. Through these activities, in a given socio-cultural environment and context, with the help of others and using different resources for learning, learners can assimilate information from the outside, and at the same time adjust their cognitive structure to accommodate that information, thereby implementing the creation of new knowledge. "Constructivist teaching not only focuses on students' learning actions, but also has to develop creative thinking in them to be able to create new knowledge in the cognitive process." [1] According to constructivism, the classroom is not a place where students perform and express their knowledge, but rather a place where teachers and students exchange and cooperate with each other in the process of knowledge discovery and creation. It is not a place to train learners, but a place to help learners to develop. It is not the place where teachers implement traditional teaching methods, but the place to fully express the wisdom and quintessence of teaching. In other words, the classroom should be like a laboratory where teachers and learners together create and develop knowledge.

3. Conclusion

On the basis of the theory of philosophy and cognitive psychology, constructivism has given the views on knowledge, on learning and on teaching. Accordingly, knowledge is not an objectively existing thing but the subject's experience, explanations and assumptions; learning is the process of creating knowledge, by which learners use their existing knowledge and experience to explain new things, phenomena, problems or information in their own way; therefore, teaching must be a process in which teachers and learners jointly create an environment to encourage learners to actively create knowledge and feel the meaning of that construction.

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