

Constructivism Learning Theory Summary

Principles

The constructivism learning theory emphasizes the learner-centered teaching theory and strategy. Learning is changing from behaviorism which demands learners to receive the stimuli passively to active recipients of external stimuli. Knowledge is obtained by constructing new knowledge to the old knowledge structure of learners. Learners become the main objects of information processing. Constructivism is based on the book, *The Principles of Genetic Epistemology*, written by Piaget (1972). In the book, he proposed his own perspectives of how the knowledge is formed and developed in learners. He opposed the S-R (stimulus - reaction) formula and proposed his S-A-R formula. A is to stimulate a response to the pattern of assimilation. Learners achieve the equilibration through adaptation, including assimilation and accommodation. Learning occurs in the process from equilibration to non- equilibration to new equilibration (Piaget, 1972).

Based on the theory of Piaget, Vygotsky (1978) proposed the social-cultural theory and the concept of *The Zone of Proximal Development*. It is called Social Constructivism. Bruner (1975) introduced the Vygotsky's theory. He states that learning is an active process of learners. Learners construct new knowledge based on their old knowledge structure. In the development of constructivism, there are many experts proposing new ideas to develop the theory. Glaserfeld (1987) proposed the theory of Radical Constructivism. M. S. Wittrock (1992) proposed the model of Generative Process. Different views of points bring about two major trends of constructivism, individual and sociocultural constructivism. Individual constructivism emphasizes the individual constructing the new concept of knowledge, and sociocultural constructivism focuses on the importance of the social interaction and cultural practice on the construction of knowledge.

Constructivism brings about new principles for learning, learners, instructors and teaching. For learning, knowledge cannot be taught to learners. Learners actively construct new knowledge with the help of peers, instructors and others, learning materials and certain context. To achieve the knowledge, learners must collaborate, communicate with others and find the connection between the new knowledge with the old knowledge in a meaningful learning context. The occurrence of learning is to break the original equilibration of cognitive structure and add the new knowledge to the cognitive structure to build a new cognitive equilibration. For learners, before learning, they have already obtained the relevant knowledge. Learning depends on the degree of active construction of learners. Just listening to the teachers and reciting the new knowledge cannot realize the learning process. Learners must actively construct their own concepts and meanings of the new knowledge. Learners are not the receiver in the learning process. They must participant in many meaningful activities to active construct new knowledge to form the new cognitive structure. For instructors, they will change the mind of being centered in the teaching process. Teachers don't possess the authority of knowledge, especially in the information society. They are the organizers. Like guiders, they help students deal with problems. And they are also the explorers to find the mistakes students may have and give the feedback timely. They are the intermedia of knowledge and students. They are not teaching the knowledge, but helping learners construct the new knowledge. For instructors' teaching process, it is necessary to put the learners in the center position. The objectives meet the learners' needs. Teaching process is not a process of transfer knowledge to students, but a

process of helping learners turn the knowledge to be their own. It is vital to create the proper learning context, design learning activities and develop learners' learning skills.

Implications

Based on constructivism, instructors recognize the knowledge is constructed by learners. With the implication of constructivism, researchers have developed many learning strategies for learning and teaching. The strategies of scaffolded instruction, anchored instruction and random access instruction are all based on constructivism. The strategies now can be well applied in instruction.

Scaffolded instruction has many definitions, such as “the systematic sequencing of prompted content, materials, tasks, and teacher and peer support to optimize learning” (Dickson, Chard, & Simmons, 1993). Scaffolding is a process in which students are given support until they can apply new skills and strategies independently (Rosenshine & Meister, 1992). In my opinion, it means to decompose the complex learning task to many small steps, in order to help learners study from the easy to the difficult and the small to the big. Once learners construct a whole concept of the task, the scaffoldings are taken away. Its advantage is to make the complex problems easy to learn. Another situation is teachers give more assistance to learners when they encounter complex problems. Teachers can give the guidance or demonstration to learners. With the decreasing difficulty, teachers reduce their help. Learners can select proper steps to start learning according to their own learning paces.

Anchored instruction is another strategy of constructivism, which has been developed by the Cognition & Technology Group at Vanderbilt (CTGV) under the leadership of John Bransford. Although many experts have mentioned to the theory and carried out research of anchored instruction, Bransford is the principal spokesperson. As explained by CTGV (1993, p52): “Our goal was to create interesting, realistic contexts that encouraged the active construction of knowledge by learners. Our anchors were stories rather than lectures and were designed to be explored by students and teachers. ” In the practice of instruction, the anchors are always authentic cases from the real world for learners to learn. Knowledge is not obtained through instructing, but experiencing authentic context by learners themselves. Learners can not only listen to the explanation from the experts, but also experience in the reality. There are many researches on the experts' explanation for learners. For experts, they are familiar with the contents and they can start from their interests of learning contents, however, as learners, when they first face to the new materials, they wonder the elementary knowledge.

Random Access Instruction is based on the cognitive flexibility theory of the development of constructivism. To carry out the strategy is in the setting of the learning content is complex and ill-structured (Spiro & Jehng, 1990, p. 165). In the instruction, facing to a complex learning content, it is difficult for learners to understand and construct knowledge. Maybe starting from different parts of the problem can achieve different understandings. Therefore, in the same problem, instructors may arrange the presentation of learning contents in different context, different objectives and different methods, so that learners can select different paths and methods to start learning. The strategy can also make learners form more different dimensions of understandings to the learning contents. From every part understanding to the whole contents' understanding, learners can well construct their own knowledge.

In the real practices of learning, the strategies can suit for different kinds of learning contents. They have the differences among them. However, the similarities are the perspectives

of learner-centered instructional design, collaboration, communication, and the real learning contexts design, etc.

Applications

Constructivism learning theory is applied in instruction for many years. Many teachers have transformed their ideas of their roles in instruction. They also experience the effectiveness of real learning context for learners. When designing a course or activities, they can apply the learning strategies of constructivism in proper settings. The research on the relationship between constructivism and curriculum theory and practice (Jan Terwel, 1999) and the direct application in nursing education (Sasikarn Kala a, Sang-arun Isaramalai a, Amnart Pohthong, 2010) show macro and micro aspects of applications of constructivism. In the past several years many attentions have been paid on the online courses design. For an online course design and learning, constructivism is also important for instructors and learners.

While instructors design an online course, they must prepare and gather information about learners, learning objectives, arranging learning contents, creating learning settings, selecting the proper learning technological tools and useful learning activities. How to apply the constructivism learning theory and strategies for better learning effectiveness and efficiency is putting learners in the center positions of learning. Firstly instructors must acknowledge the learners' backgrounds, learning characteristics and learning styles. However, it is more difficult for an online course to carry out such survey. Learning objectives in the syllabus are in the Zone of Proximal Development, so that learners can have confidence in learning. Learning contents meet the needs of learners. Instructors also need to set scaffoldings to assist learners to learn well. For the complex problems or assignments, instructors should give the examples or demonstration to learners. The necessary guidance can help learners construct their own knowledge. And instructors welcome the different methods or paths to solve the problems learners encountered in the learning process. All the learning methods and skills are also the achievements of learners, which is more important for their lifelong learning. The learning context designed in an online course also encourages learners to cooperate with their peers. The context reflects the real problem setting. Recently, mobile learning can support to carry out the real research in the reality while learning from mobile handheld learning devices and make some records at the same time. The evaluation of online learning emphasizes the formative evaluation. The experience of learning process is more helpful for constructing own knowledge.

Learners in an online course cannot construct their own knowledge structure if they passively follow the steps instructors set or just finish the learning assignments. From individual constructivism, the occurrence of learning is to transfer the new knowledge into their old knowledge structure and rebuild their knowledge structure. Learners must realize that knowledge and skills cannot be required by reciting in memory and completing the assignments. And in the online learning setting, learners are in a social community. They cannot wait for peers and instructors to ask them to participate in some discussion or activities. They should be the active participants to learn from each other through discussion and collaboration to complete a task. Learners must well take advantage of learning materials and learning tools, and experience the learning context to obtain knowledge or skills. Learners' total involvement in an online course is the result of knowledge construction.

Constructivism with behaviorism and cognitivism is better applied in instruction. Constructivism is based on cognitivism and has some different ideas from behaviorism. However, all the learning theories are meaningful and useful for learners and instructors.

References

- Bruner, J. S. (1975). The ontogenesis of speech acts. *Journal of Child Language*, 2, 1-40.
- Cognition And Technology Group At Vanderbilt (1992). The jasper series as an example of anchored instruction: theory, program description, and assessment data. *Educational Psychologist*, 27(3), 291-315.
- Dickson, S. V., Chard, D. J., & Simmons, D. C. (1993). An integrated reading/writing curriculum: A focus on scaffolding. *LD Forum*, 18(4), 12-16.
- Jean Piaget. (1972). *The Principles of Genetic Epistemology*. New York: Basic Books.
- Kala, S., Isaramalai, S.-a., & Pohthong, A. (2010). Electronic learning and constructivism: a model for nursing education. *Nurse Education Today*, 30(1), 61-66.
- Rosenshine, B., & Meister, C. (1992). The use of scavolds for teaching higher-level cognitive strategies. *Educational Leadership*, 49(7), 26-33
- Spiro, R., & Jehng, J. (1990). Cognitive flexibility and hypertext: Theory and technology for the nonlinear and multidimensional traversal of complex subject matter. In Nix, D., Spiro, R.(Eds.), *Cognition, education and multimedia: Exploring ideas in high technology* (pp. 163-205). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Terwel, J. (1999). Constructivism and its implications for curriculum theory and practice. *Journal Of Curriculum Studies*, 31(2), 195-199.
- Von Glasersfeld, Ernst. (1990). Chapter 2: an exposition of constructivism: why some like it radical. *Journal for Research in Mathematics Education*, 4(2), 19-210.
- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.
- Wittrock, Merlin.C. (1992). Generative learning process of the brain. *Educational Psychologist*, 27(4), 531-541.