

Challenges of ICT Based Constructivist Approach in Teaching Learning

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Abstract

Constructivism states that learning takes place in contexts, while technology refers to the designs and environments that engage learners. This study was based on two premises. The first concerns the implementation of the ICT- enhanced constructivist learning today in classroom. The second refers to the emerging need for the appropriate teacher education and professional development as a presupposition for the implementation of constructivist innovation in classrooms.

Keywords - ICT, Constructivist, Knowledge, Learners, Teaching-Learning

Introduction

Information and communication technologies have revolutionized our society. In last two decades, technology has dramatically penetrated into every area of society and, every aspect of social and cultural lives. Television was the initiator. Television rediscovered and recast the world as a direct experience. Computers made it possible for vast amount of information to be made instantly available and modified, with a keystroke. The very nature of work has changed, with an increasing demand for workers who could master the new technologies and use them to conduct business that formerly did not require computer at all. Our children have been raised in a world of instant access to knowledge. They are used to create an environment where they control information flow and access with the press of a button, in which geographic mobility, intellectual flexibility, and synthesis of work and learning are the norms in the work place.

Constructivism

Constructivism means that knowledge is not given, but constructed. It is a rather heterogeneous idea. We invents our own concept and ideas, linked to what we already know. This meaning making theory of learning is called constructivism, knowledge is constructed by learners through an active, mental process of development; learners are the builders and reactors of meaning and knowledge.

According to *Crotty* (1998, p58) the term constructivism refers to the epistemological consideration focusing exclusively on ‘the meaning-making activity of the individual mind’ and constructionism focuses on ‘the collective generation (and transmission) of meaning’.

According to *Brader - Araje and Jones* (2002) Constructivism can be defined as “the idea that development of understanding requires the learner to actively engage in meaning-making”.

Integrating ICT & Constructivism

Although innovative ideas on teaching and learning have been progressively introduced over the past few decades, traditional views have been difficult to change. Such views often consider students as “empty vessels” waiting to be filled with knowledge. Students are now learners who come to the classroom with their unique

backgrounds, experience, conceptual understanding, learning styles and personal circumstance. Teachers now become learning facilitators rather than reservoirs of knowledge. Psychology of learning has shifted from behaviorism to cognitivism to constructivism.

“The web is where constructivist learning can take place the web provides access to rich sources of information; encourages meaningful interactions with content; and brings people together to challenge, support, or respond to each other” (Khine, 2003, p 22-23). However, merely providing students with access to the web does not guarantee constructivist learning. The lecture is required to provide some guidance, or coaching to allow students to create their own meanings. Russel and Schneiderheinze (2005) argued that a critical factor which shaped how lectures used ICT to develop learning, was the lectures academic belief and acceptance of constructivism.

Constructivist Learning Theory

The Constructivist theories of learning dominate today and propagate that learning is achieved by the active construction of knowledge supported by various perspectives within meaningful contexts and social interactions (Oliver, 2002). These environments create engaging and content-relevant experiences by utilizing ICTs and resources to support unique learning goals and knowledge construction (Young, 2003). The constructivists believe that there is no single version of reality, rather a multitude of realities situated within each learner. As such, learning is dependent upon the “learner’s ability to analyze, synthesize and evaluate information to create meaningful, personalized knowledge (Philips et al.,2008).”

The guiding principle of constructivist learning theories is the learner’s own active initiative and control in learning, and personal knowledge construction, i.e., the self-regulation of learning. The student does not passively take in knowledge, but actively constructs it on the basis of his/her prior knowledge and experiences (Piaget, 1972). From the pedagogical point of view, the learner’s learning activities should be directed at examining his own prior conceptions and relating it to new knowledge. The learning environment should provide the learner with opportunities to test and try out his new conceptual understanding, in various applied circumstances like problem solving. Constructivism can therefore be contrasted with objectivism, the traditional view that knowledge is an external entity with an absolute value which can be transferred from teacher to learner (Duffy and Jonassen, 1992).

Principle of Learning environment in Constructivist Approach

The Principles by which learning environments may be built should therefore focus on four general systems attributes context, construction, collaboration and conversation.

Context: Context includes features of the real-world setting in which the task to be learned might naturally be accomplished. These features which are replicated as faithfully as possible in the learning environment may include the physical, organizational, cultural, social, political and power issues related to the application of the knowledge being learned. Attention to context, a central tent of constructivist learning theories such as Situated Cognition and Cognitive Apprenticeships.

Construction: Construction of knowledge is the result of an active process of articulation and reflection within a context. The knowledge that is created is a product of the mind and results from the individual’s experience with and interpretations of the context (Jonassen, 1991). Those experiences can be encountered in learning environments as well as in the real world. Learning environments are constructive only if they allow individuals

of groups of individuals to make their own meaning for what they experience rather than requiring them to learn the teacher's interpretation of that experience or content.

Collaboration: Collaboration among learners occurs throughout the learning process. Collaboration aids in developing. Testing and evaluating different beliefs and hypotheses within learning contexts. Through the process of articulating covert process and strategies, learners are able to build new and modify existing knowledge structures.

Conversation: Conversation is necessitated by collaboration. Individuals and groups must negotiate plans for solving situated problems before initiating those plans. This planning involves reflecting on what is known, what needs to be known, the viability of various plans, and their potential effectiveness. Conversation is an essential part of the 'meaning-making' process because knowledge, for most people, is language mediated.

Benefits –

The benefits of a constructivist approach, broken down by specific are of learning: Develop thinking skills.-

- ❖ This develops flexibility in thinking and reasoning skills, as students compare and contrast various possibilities in order to draw their conclusion.
- ❖ Problem solving teachers students to consider multiple perspective on a given situation or phenomenon.
- ❖ Students also learn to make connections and associations by relating the subject matter to their own life experience.
- ❖ Students learn to support their conclusion with evidence and logical arguments.
- ❖ Students learn to synthesize several sources of information and references in order to draw conclusions and them evaluate these conclusions.
- ❖ Students learn to question ideas and knowledge through the process of comparing contrasting alternative ideas and contexts.
- ❖ Students are encouraged to engage in individual reflection in order to organize and understand the world.
- ❖ Students experience insights as they think through a problem or inquiry activity, and draw inferences that allow them to go beyond the simple acquisition of facts and information by learning how to see implication and apply them to other situation.

Challenges of ICT Based Constructivist Approach in Teaching-Learning

The increasing use of ICT in the field of teaching learning arises some challenges in front of the teacher the present classroom context all over the country.

- Teachers who are not familiar with constructivist approaches, using ICT based cognitive tools may first require a change in educational philosophy. They must be committed to learn and to change.
- Teachers should be trained to constructivist and cognitive tools and technique well enough in order to facilitate their use by their students. Cognitive tools are not computer games and it is unrealistic to expect students to be able to work with them without the teacher's support and guidance. Teachers can only model, coach, and scaffold learning if they understand the tools and their purpose. The importance of teacher preparation and support for successful implementation of constructivist approaches to the teaching of thinking skills cannot be overemphasized.
- The teacher's role will have to be changed from that of purveyor of knowledge to instigator, promoter, coach, helper, model and guide of knowledge construction. Teachers who are so used to showing students how to do things and providing them readily with the answers they want will find it painful to see the frustration experienced and expressed by their students as they learn to think for themselves. Teachers should try to avoid telling students what they have constructed are wrong.

- Students should be permitted to express ideas in terms of that which are more meaningful to them. When students have ownership of ideas, they are more willing to generate and use them.
- Students can initiate searches more and more independently using ICT.
- The Internet and its graphic window, the World Wide Web, have made vast amounts of information available in a timely fashion.
- Teacher can encourage searching and classification more readily in a ICT based environment. (Filtering software protects younger students from inappropriate areas on the World Wide Web)
- Primary source material is increasingly available in forms that allow it to be incorporated into student-created archives and knowledge constructions. Educational institutions have posted much material useful in the sciences, mathematics, literature, and social sciences. As an example, the first recordings studios, early photographers, and explorers' accounts.
- Teacher should try to avoid telling students what they have constructed are wrong. They should instead be less critical by “perturbing” the students' models (Jonassen, 2000), and not criticizing nor discouraging. It is the models that the teacher should be questioning, not the students.
- Instruction should be built around more complex problems, not problems with clear, correct answers. Instruction must be concerned with experiences and contexts that make students willing & able to learn.
- If cognitive tools are used for instruction but learning outcomes are assessed with recall measures then students will fall back to their old routine of memorizing the content.

Conclusion

In order for ICT to be used effectively in the classroom, teachers have to make sure that they are using it as part of an approach that involves the students in the activity. Constructivist approaches, with their focus on student-centered learning, have long advocated student involvement in the process of gaining knowledge and have sought ways for teachers to become advocates in the learning process rather than as figures who only dictate information. This approach seems to be a good match for the technological (ICT's) applications being developed today.

ICT as part of a learning theory is more than a tool; it becomes the framework for the methodology. For those who are looking for ways to enhance their constructivist approach to instruction, technology provides the ability to support all of the central themes of this theory. Teachers are less hesitant to use technology because they can see that it helps them design their instruction in such a way that supports their theoretical approach. Using the two together-ICT and constructivist theory - provides a better use and integration of technology tools into the classroom in an effective manner.

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