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ICT Pedagogy in Higher Education: A Constructivist Approach

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Abstract

Information and communication technology (ICT) has been an integral part of pedagogy in educational institutions in general and higher education in particular. My focus in this paper is to see how ICT plays a role in constructing knowledge and improving learning in the higher educational institutions. The arguments are based on the review of existing ICT related literature, and in-depth interviews with few ICT pedagogy and social constructivist related educationists. So, the method applied is qualitative. First, ICT plays a role of a means to an end in the sense that it carries messages with higher level of accuracy. Second, it makes the interactions among the target group 'living' and creates the environment for effective learning. Third, ICT links the performers (teachers and students) in the learning groups cognitively and affectively to transform the unit of learning among the learners. This means that ICT plays a vital role in the part of the learners in which they are liberated from their teachers' dominance.

Keywords: Constructivist approach; higher education; ict; knowledge building; pedagogy.

Introduction

In the recent decades, ICT has brought about unprecedented change in the society allowing people from distance to communicate in fix time using information technologies. Moreover, the websites of social network have also allowed us to be in contact. As a result, modern ICTs have created a "global village", where we can communicate across the world (Akkalwar, 2013). Moreover, Internet, World Wide Web as part of ICT has contributed to the quality of learning materials. Through ICT any number of learners from anywhere and at any time can easily have access to a large number of resources.

In this way, modern ICTs have supported individual and society for global reach. Similarly, Gulbani and Joshi (2012) mentioned that ICT is a potentially powerful tool for extending educational opportunities and it can provide remote learning resources.

Constructivism, a theory of human interaction into knowledge generation, has made its influences in many academic fields, like sociology, psychology, pedagogy and science. It believes that knowledge generation is possible only through interaction and discourses between and among individuals. Phillips (1995) argued that constructivism is possible through

various roles of a learner such as active learner, social learner and creative learner. He further argued that learning is a social construction which means we make meaning of knowledge only through interaction with others. Moreover, constructivists believe that knowledge can be created and recreated which demands active involvement of the learners to discover new knowledge (Pritchard & Woollard, 2010).

There are many forms of constructivism including personal constructivism, radical constructivism and social constructivism. Personal constructivism is based on Piaget's work that emphasizes learning on individual basis depending upon individual needs. This is considered as the expansion of Piaget's model of cognitive structures (Piaget, 1972). Radical constructivism, on the other hand, is based on the work of Ernst von Glasersfeld. This kind of constructivism deals with two principles: one, the knowledge is actively constructed and two, it is meaningful only through the organization of learners' experiences (Glaserfeld, 1995). The third form of constructivism is social constructivism, which is believed to be based on the work of Joan Solomon. According to him, knowledge held by individuals is always on the path of modification with social effects on it.

Methodology

This research was purely qualitative in nature. I conducted in-depth interview with related experts in addition to the review of relevant literature. The review and the interview focused to answering my research question "How can we relate the current practice of ICT in higher education with social constructivism?"

Findings and Discussion

Based on the data collected by interviewing my study participants, I came up with the two different themes namely ICT in Knowledge Building and ICT Pedagogy and Social Constructivism. These themes along with respective data and relevant literature are

presented and discussed as follows:

ICT Pedagogy and Social Constructivism

ICT seems pervasive throughout the learning endeavor in higher education, but it still requires intensive efforts to be meaningful in addressing the learners' need of learning in the present world. In this regard, one of my research participants offered me his experiences as follows:

"There is not much use of information technology (IT) in the current practice of higher education in Nepal. But, it has taken its momentum. Basically, the Private higher education institutions have moved towards this direction. Moreover, Open Distance Learning (ODL) programs run by Universities and/or other Higher Education Institutions (HEIs) also use ICT in delivering its pedagogy to the students. So far, the interaction as such has not been promoted in regular classes where teachers use the "idle" technology, the PowerPoint presentation..."

On the other hand, the application of ICTs in pedagogy, MOOC¹, has made meaningful interaction with the students. Modular Object-Oriented Dynamic Learning Environment (MOODLE) has also been useful in the context in which students individually becomes active to interact with the system and with instructors.

Similarly, next participant said: "...Each knowledge should be revised and updated for 21st century. Moreover, the maximum potential of ICT should be used to investigate authenticity of the resources that are provided. ICT is a means and not an end. Information technology facilitates students to gain new knowledge, but it equally depends upon how to use it. In today's world ICT has been used to search for new knowledge. Countries with richer resources have been able to do this and countries with poorer resources are still struggling towards the direction....."

¹ Massive Open Online Course

This explains that the use of ICT in HEI²s have definitely helped students understand the content. Again, simply understanding the given contents does not seem to be enough. A key question can be raised in this regard: has ICT contributed to better learning?

Next, it has also given opportunities to the students for asynchronous learning through recorded programs. In contrast to cognitive-constructivism, social constructivism emphasizes “collective-learning” where the role of teachers, parents, peers and other community members in helping learners and making learning fruitful. So, social constructivists also emphasize that learning is an active, contextual and social, (Tinio, 2002). Social constructivists talk about technology-adoption as a process of involving social groups into the innovation process where learning takes place on the learners’ experiences, knowledge, habits and preferences (Bondarouk, 2006).

Hussain (1999) described learning as a social process taking place in and outside the classroom. Classrooms are social bodies where students interact with each other and their instructors for knowledge construction. There seems to be a consensus among different constructivists like that learners construct knowledge through social interactions with each other.

ICT Pedagogy and Social Constructivism

The concept of social constructivism has been introduced since 1990s. After that, research started on interpretive design and computer-based information systems had developed and penetrated into the society (Bondarouk, 2006). Along the continuum of objectivist/relativist to constructivist modes of pedagogy, learners find changing learning environments with ICT. There is one-way communication and actions of teachers rather than their interaction with the students (Young, 2003). On the other situation of social constructivist learning environments, learners follow self-designed, self-controlled and socially collaborative learning-tracks (Phillips, Wells, Ice, Curtis, & Kennedy 2008). The

middle stages of this continuum are characterized by a mix of both the absolute positions. Learner’s understanding depends upon the social and cultural context where the learning is happening. The notion of social constructivism is closely associated with the development theories of Vygotsky and Bruner and that of social cognitive learning of Bandura. Reality, knowledge and learning are three major concepts of social constructivism (Pritchard & Woollard, 2010, P-7).

While talking on social constructivists, reality is constructed through human activity, that is, knowledge is socially and culturally constructed and learning is a social process (Pritchard & Woollard, 2010). For all these assumptions, they see the role of communication to be vital only by which socially agreed ideas and social patterns can be understood (Kim, 2001). This includes the extension of the understanding of new information and activities among the group members (Rogoff, 1990). In social constructivism, learning is an exploration and discovery rather than a passive didactic approach in the classroom. It is multidimensional, as described by Young (2008), who mentions the application of knowledge in different contexts whether of experts or non-experts, how they construct, challenge and modify knowledge, and further how they challenged both forms within the community and from without (p.9) for learning meaning.

Likewise, Scardamalia and Bereiter (2006) state that students are not mere learners or inquirers; they are members of knowledge building community. In social constructivists’ perspective, classroom teaching is supported and facilitated by technology especially the telecommunication tools (Mumtaz, 2006). These tools provide student with opportunities for interactivity, a process of social learning. In this regard, Vygotsky believes that, “the classroom should provide variety of learning materials (including electronic) and experiences and the classroom culture provides the child with cognitive tools such as language, cultural history, and social context” (as cited in Driscoll 2000).

² Higher Education Institutions

The progress and development of educational pedagogy has interesting phenomena with the development of computer technology. It especially focuses on personal computer technology (Basturk, 2005). In these days, as the internet and World Wide Web have matured; the social aspects of learning as described by Vygotsky have become very useful for those who are looking to design educational projects for involving communicating audience (Lane, 2001). From the perspective of teacher development, Shulman (1986) sees the gap in knowledge growth in teaching and asks several questions: Where do teacher explanations come from? How do teachers decide?, what to teach? How to represent it? How to question students about it? How to deal with problems of misunderstanding? (p. 8).

From the perspective of social constructivism, on the other hand, learning is a collaborative process which is differentiated between two developmental levels. Distinguishing between these levels as actual development and potential development has resulted in Vygotsky's identification of the "zone of proximal development" (Vygotsky, 1978, p. 85). The zone of proximal development is the potential level of cognitive development which a learner acquires if he is provided with the appropriate support.

Furthermore, social interaction, a key component in the social constructivist pedagogy, is also significantly changed by the impact of technology (Ford & Lott, n.d). Then, major transition in communication media from speech to print and from video to electronic form has changed our means to create, record, store, distribute, access and retrieve information. As a result of these changes, the social interactions between students and students, and teachers and students have changed. At this context, students are no longer dependent on teachers as the main source of information. For this perspective "web-based environments are becoming important forums for joint problem solving, knowledge building and sharing of ideas" (Nevgi, Niemi, & Virtanen, (2006).

Prior to such development of technology, a social presence was communicated by dialogue and social clues such as facial expressions, non-verbal clues and inflection (Nevgi, Niemi, & Virtanen, (2006). Communications between and among the students, the teachers and the learning materials are the cornerstones of technology. Moreover, it demands a clear and concise interaction of the learners with technological devices (Desai, Hart, & Richards, 2008) in the distance education environment.

According to Hussain, (2012), higher education is considered to be an apex body in all educational systems. It mainly focuses on knowledge creation and its dissemination. Further, Hussain in his paper states that teaching, learning and research are considered to be the main activities in higher education. Besides, there are some interrelated and associated activities which seem to expand the outcomes and effectiveness of higher education. Such activities include instruction and instructional mechanism, learning activities, institutional environment and infrastructure, innovations and interventions etc.

Knowledge building with ICT

ICT has also been contributed to building up knowledge profoundly. Scardamalia and Bereiter (2006) mentioned that knowledge building is also a kind of social constructivism. Further, they elaborated the knowledge building with the process of CSILKBE³. The difference between learning and knowledge building is visible. Scardamalia and Bereiter (2006) maintain that learning is an internal, unobservable process that results in changes of belief, attitude, or skill while knowledge building, by contrast, results in the creation or modification of public knowledge. In knowledge building pedagogy, all ideas are treated as improvable, and that idea improvement is its basic and explicit principle. Additionally, Scardamalia and Bereiter (2006) mentioned the perspectives of knowledge building with idea of "knowledge of knowledge". "A growing number of "knowledge societies" are joined in a

³ Computer Supported Intentional Learning to Knowledge Building Environment

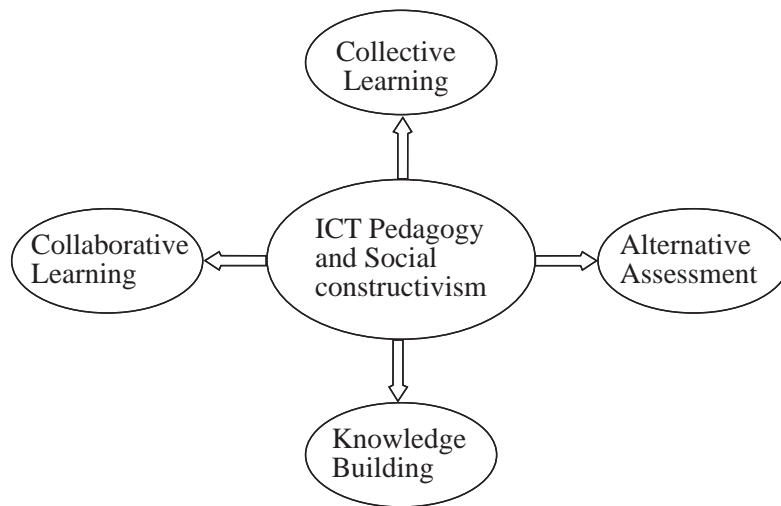
deliberate effort to advance all the specific knowledge” (p. 1).

As far as higher education is concerned, many researchers explain ICTs as a form of learning based on small groups in which contents are shared by using ICT to access, create, share, build and continually improve ideas of sharing and creating knowledge specifically in higher education. In the same way, Sfard (1998) maintains that learning processes have different possible metaphors: one is

an acquisition metaphor and other is a participation metaphor. The first one is a process of acquiring chunks of information, typically delivered by a teacher, while the second one is a process of participating in various cultural practices and shared learning activities.

Based on the data and discussions mentioned above, I came up with the following figure to elaborate the components of ICT pedagogy in social constructivism.

Figure -1. Components of ICT pedagogy in social constructivism.



Conclusion

ICTs have been an essential tool to construct knowledge building in higher education. It helps students in constructing knowledge in their social periphery. ICTs are the demanding need in higher education particularly in the context of building up knowledge. The need of massive knowledge in the part of learners appears to be imperative due to their growing access to globalization. As a result, people seem to feel the need of new knowledge to meet their local and global requirements.

This paper, thus, focused to bring forth the role of ICT in building up new knowledge in higher

education. Based on qualitative research, there emerged two different aspects of learning in this regard. First, use of ICTs can be useful in constructing new knowledge in the way that it facilitate learners and teachers interact in a creative and meaningful way. Second, the learners use ICTs to make meaning of the contents and context of their own surrounding which becomes helpful to live their life in easy way. For this kind of knowledge construction, they need to be in contact with the availability of the ICT tools that broadens their horizon in one hand, and update their knowledge on the other. It, therefore, seems essential for higher education institutions to consider ICTs not as a separate part of pedagogy, but

indispensable to the pedagogical process.

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