Constructivism and its Implications

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Constructivism is a learning theory that is based on the notion that learners construct their own knowledge and understanding of the world as they make sense of their experiences (Brown & Green, 2011; Driscoll, 2005). In the last few decades, constructivism has emerged as a leading educational approach (Brown & Green, 2011) The underlying assumption that knowledge is flexible and ever-evolving is the basis for various approaches and methods that are being developed by constructivist theorists, researchers and educators (Driscoll, 2005). Gardner, Sternberg and Jonassen are three key present-day theorists who have shaped various aspects in the development of constructivism theory (Brown & Green, 2011). According to Falance (2001) and Duffy & Cunningham (1996), the philosophical underpinnings of constructivism can be traced as far back as the work of Giambattista Vico, an 18th century philosopher who theorized that "humans could only clearly understand what they have themselves constructed" (Falance, p.213).

Constructivism is rooted in the disciplines of education, psychology and philosophy (Brown & Green, 2011; Duffy & Cunningham, 1996). Some educators view constructivism as a somewhat elusive and hard-to-define concept about learning that is more a philosophical approach than an instructional model or theory per se (Duffy & Cunningham, 1996; Falance, 2001). Dabbagh & Bannan-Ritland (2005), however, have concisely summarized the epistemological basis and key components of constructivism as follows:

> In constructivist theory, the learner is viewed as an active participant in the instructional experience, developing knowledge through a process of perception and meaning making. Situations, activities, and social interactions are constantly challenging the learner's

> understandings, which results in new meanings. Therefore, the context or the activity, which frames the knowledge, is as important to the learner as the knowledge itself. Knowledge or cognition in the constructivist view is perceived to be indexed or linked to the experiences in which it was learned, which results in multiple representations and infinite juxtapositions. Rather than acquiring concepts as abstract, self-contained entities, a person acquires useful knowledge through understanding of how knowledge is used by a group of practitioners or members of a community. (p. 167)

Thus, key aspects of constructivism are (Dabbagh & Bannan-Ritland, 2005; Duffy & Cunnimgham, 1996; Falance, 2001):

- Learners actively engage in the process of constructing knowledge;
- The social framework (context) for learning is as important as the content;
- Knowledge is flexible and changes as a learner has new experiences'
- Knowledge is most useful when the learner understands how to successfully apply it within a larger community;
- Instruction is intended to support construction of knowledge, not simply communicate it.

Given this model of constructivism, however, it is not immediately clear what a constructivist learning environment might look like. Most learners who have been students in a traditional learning environment automatically assume that instruction works best in a classroom with the teacher at the blackboard and the students at their desks with their textbooks. At the root of this structure, however, are objectivist assumptions, which in turn have significant impact on the learning environment. In short, objectivism posits that there is reliable, structured

information in the world outside of the learner, and that learning occurs when students assimilate the content into their bank of knowledge (Jonassen, 1991). Theorists often contrast constructivism with objectivism because of the clear differences between the assumptions of the two epistemologies (Driscoll, 2005).

Just as objectivism influences the traditional classroom, constructivism has significant implications for the design of learning environments and the design of learning activities, in particular. These include authentic assessment methods, learning through exploration, problem-oriented activities, "rich" environments, and visual formats and mental models (Dabbagh, 2012). It is important to note, however, that constructivist activities and approaches are not always the most appropriate or effective for every learning problem (Jonassen, 1991).

Ertmer and Newby (2008) suggest that constructivist learning environments (CLEs) are most appropriate for addressing how to deal with ill-defined problems and complex situations. In their article titled *Behaviorism, Cognitivism, Constructivism: Comparing Critical Features from an Instructional Design Perspective,* they offer several considerations that instructional designers should think about when designing CLEs. According to the authors, CLEs should (a) emphasize the context in which learners can apply their knowledge and skills, (b) encourage the learners' active creation, use and manipulation of new information, (c) allow information to be presented to learners in various arrangements at different times and (d) develop problem-solving and pattern recognition skills (pp. 65-66). Thus, their discussion of CLE's primarily emphasizes the role of the learner.

But the design strategies behind a CLE must also consider and address the role of the instructor and how the learner will interact with peers. Recall from Dabbagh & Bannan-Ritland (2005) that social factors also impact the CLE, as learners actively create meaning through

situations, social interactions, and activities. Jonassen (1991) argues that instructors must give up some of their control and authority in the learning environment and instead should "engage learners in negotiating meaning and in socially constructing reality…[and] prepare learners to regulate their own learning by providing supportive rather than intervening learning environments" (p.13).

The situated cognition pedagogical model (or "mind as a rhizome") is at the root of constructivism (Dabbagh & Bannan-Ritland, 2005; Duffy &Cunnigham, 1996) and suggests that knowledge is not static; rather, it exists outside of an individual mind and is a collective consensus that evolves over time through continuous social negotiation. Dabbagh & Bannan-Ritland (2005) explain "…the "mind as a rhizome" metaphor is not intended to describe how knowledge is represented in a single mind, but rather how knowledge is distributed across multiple minds and the interactions or activities that connect these minds through the use of tools and symbols forming sociocultural and other contexts (p. 166).

Various current pedagogical models demonstrate the strategies central to constructivism. These include situated learning, or anchored instruction; problem-based learning; cognitive apprenticeships; cognitive flexibility hypertexts; communities of practice, or learning communities; computer-supported intentional learning environments; microworlds; simulations; and virtual learning environments (Dabbagh & Bannan-Ritland, 2005) among others. My project, "Disability Discrimination in the Workplace" (located online at http://mason.gmu.edu/~droyer/WDDCFH/WorkDisabilityDiscriminationCFH.htm) is a Cognitive Flexibility Hypertext (CFH) constructivist-based learning environment.

The main characteristics of CFHs are summarized as follows (Dabbagh & Bannan-Ritland, 2005):

- Provide multiple perspectives
- Promote theme-based learning
- Support case-based learning through hypermedia technology
- Link content to cases
- Provide learning of complex content and concepts
- Allow students to develop meaningful, personal schemas of the knowledge domain
- Provide cognitive flexibility by varying the temporal and conceptual presentation of the content
- Promote transfer of learning to real-world contexts

CFHs are based on the principles of cognitive flexibility theory, which stresses that "real-world" issues are complex and knowledge often needs to be restructured in response to situational demands (Dabbagh & Bannan-Ritland, 2005). CFHs, therefore, support the self-directed exploration of learners in a hypermedia environment that addresses a complex subject matter or domain (Dabbagh & Bannan-Ritland, 2005). They are designed to create an interactive and multi-faceted experience for the user by presenting various cases, themes, and perspectives (often in a variety of media formats), with the expectation that learners will eventually use their new knowledge beyond the learning environment (Dabbagh & Bannan-Ritland, 2005).

In my project, the "Disability Discrimination in the Workplace" CFH website (see http://mason.gmu.edu/~droyer/WDDCFH/WorkDisabilityDiscriminationCFH.htm), I applied the various principles and characteristics that are central to CFHs. For a complete mapping, see the Project Design Table at http://mason.gmu.edu/~droyer/WDDCFH/RoyerDesignTableCFH.pdf. The "Disability Discrimination in the Workplace" CFH allows users to explore the ill-structured,

knowledge domain of disability discrimination as it occurs in the workplace. The premise of the CFH is that it has been developed for graduate business and human resources students at "DLR University", a hypothetical university (please see the Project Proposal located at http://mason.gmu.edu/~droyer/WDDCFH/RoyerProposalEDIT730Original.pdf).

Users acquire knowledge as they direct themselves in a non-linear fashion through the learning environment by accessing various interrelated cases, themes, and perspectives. The cases include Kevin, the "Scarred Clerk", Jenny, the "Blind Administrator" and Bo, the "Alcoholic Chauffeur". Each case contains the perspectives of various individuals (such as coworkers, executives, managers and customers), to allow the learner to clearly see how the same situation can be interpreted differently. The themes include False Perceptions, Misinterpretation of Reasonable Accommodation, and the 'Social vs. Medical' Model of Disability. Again, the themes are presented to introduce the topic and allow the learner to create a mental schema and be able to more readily consider how the theme might relate to some or all of the cases.

I presented the content in various formats and media (text, audio, pictures, video) supported by the World Wide Web, to encourage the flexible acquisition of knowledge and support its transfer to real-world contexts. The CFH also provides access to a discussion blog, where learners can interact with fellow learners, post their thoughts and complete guided exercises that help them to personally assess their level of learning. Users also have easy access to widespread resources (such as "Ask the JAN Experts" and a "Disability Quicksearch" tool via hyperlinking.

Workplace disability discrimination is a complex real-world problem that is often confusing and overwhelming to individuals who may not have dealt with disability issues before.

Cases of illegal discrimination are not always clear cut. However, learning solutions such as the "Disability Discrimination in the Workplace" CFH can be useful as part of a strategy to minimize workplace disability discrimination by increasing awareness and encouraging the thoughtfully reflection of the issues on a case-by-case basis.

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