

# Interaction in Web-Based Learning

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## INTRODUCTION

At the beginning of the 21<sup>st</sup> century, we are faced with an age of rapid technological development in information and communication. Issues of educational reform have never been more urgent than now. One of the major challenges is how to design our educational system, in general, and our methods of instruction, in particular, to produce graduates who are better prepared to take up jobs in a knowledge-based environment characterized by a pervasive use of information communications technology (ICT). ICTs, especially modern digital ones, include various types of computers; digital cameras; local-area networking; the Internet and the World Wide Web; CD-ROMs and DVDs; and applications such as word processors, spreadsheets, tutorials, simulations, e-mail, digital libraries, computer-mediated conferencing, videoconferencing, and virtual reality (Blurton, 1999). Four main features of these modern digital ICTs make them stand out as very useful educational tools. These are integration of multimedia, flexibility of use, connectivity, and interactivity (Blurton, 1999).

The main focus of this article is an examination of just one of these features: interactivity. While interactivity has been a subject of considerable attention in the search for newer and more active methods of teaching and learning (Allen, 2003; Parker, 1999; Simms, 1999, 2000), there still remains a lot to be discussed as to how it can be enhanced in learning situations involving a mixture of Web-based course administration and face-to-face classroom instruction. It is quite clear that the introduction of ICTs into distance learning curricula is crucial in enhancing interactivity, given the situation where teacher and student are separated by distance. It is shown here, based on experiences with courses designed for both distance learners and traditional face-to-face classroom students where there is unity of time and unity of venue, that the use of the Web, one of the new digital ICTs enumerated above,

along with other accessories and software that together give us what is termed Web-based teaching in a course, plays a crucial role in enhancing interactivity. The article is organized as follows. The next section defines interactivity and shows the important role it plays in constructive and active learning theories. Then, the main features of a course designed to achieve interactivity are described and it is shown how interaction was achieved. The section after that points to certain challenges that should be overcome to create more opportunities for enhancing interactivity in Web-based teaching in the future.

## INTERACTIVITY AND ITS ROLE IN CONSTRUCTIVE LEARNING THEORIES

### What is Interactivity?

Studies that focus on interactivity include Allen (2003), Barnard (1995), Bodomo, Luke, and Anttila (2003), Daniel and Marquis (1983), Laurillard (1993), Markwood and Johnstone (1994), Moore (1992), Moore and Kearsley (1996), Parker (1999), Simms (1999, 2000), and Wagner (1994). The key concepts that run through most of these studies include active learning, two-way communication, critical conversation, transactional distance learning (Moore, 1993), and so forth. All these contrast sharply with what would take place in traditional passive and digestive lecture-type instruction.

Moore (1992) offers three types while Markwood and Johnstone (1994) provide four types of interactivity. In Moore's typology, we have learner-content, learner-instructor, and learner-learner interactivity. Learner-content interactivity is illustrated by a student reading a book or a printed study guide (Parker, 1999). The interactivity of the content is very much a function of how the material is structured and accessed. This point is crucial in

deciding how best to place course notes on the Web. Instructor-learner interaction is the core of the teaching process. The success of the course design will depend largely on whether the conversation between teacher and learner is such that the learner can increase self-direction and construct new knowledge or not. Learner-learner interaction involves students working together to discuss, debate, and attempt to solve problems that arise in their study of the course materials. Moore (1992) provides practitioners with a very useful framework to discuss how interactivity is achieved in teaching. Indeed, his notion of transactional distance theory (Moore, 1992, 1993; Moore & Kearsley, 1996) has contributed immensely in defining relations between participants, not only in a distance learning situation, but also in traditional face-to-face classroom learning situations.

Markwood and Johnstone (1994, p. 94) describe interaction as the “silent, critical, creative conversation within the learner’s mind that is spurred and supported by the learning environment.” The study outlines four different types of interaction that trigger what it calls critical conversation. The first is interaction with media where individual students scrutinize textbooks, videotapes, or any other course material. In the course to be discussed, this involves a major textbook supplemented by a number of other book sections and course notes. The second is interaction with resources. Here, individual students or groups may collaborate with tools such as those used by professionals, including word processors, electronic libraries, laboratories, and studios. The third type of interaction according to Markwood and Johnstone involves interaction with experts. This would mean students converse with an instructor or other experts in real time. The last type of interaction is one of interaction through electronic exchange, with students electronically or digitally sharing the results of newly formed knowledge over a period of time (Markwood & Johnstone, 1994).

Moore (1992) and Markwood and Johnstone (1994), along with more recent works such as Allen (2003) and Simms (1999, 2000), provide a solid foundation on which to build an idea of interaction and draw up a typology of interaction within the larger framework of what we introduce here as a conversational learning community (CLC). In conceptualizing a CLC, we see the pedagogical process

as taking place in an interactive conversational learning community. In this community, we have the instructor(s), learners, course materials, and links to remote experts and resources. All these are the core components for the function of instructional interactivity in a CLC. Allen defines instructional interactivity as the interaction that actively stimulates the learner’s mind to do those things that improve ability and readiness to perform effectively. Interactivity is shown to be the single cementing factor that binds all the elements together in a CLC.

## **The Role of Interaction in Constructive and Active Learning Theories**

Theories of learning within education and allied fields such as psychology and cognitive science have proliferated over the years. New pedagogical methods based on these theories are turning away from passive methods of teaching that require no action on the part of the student beyond listening and taking notes, to interactive delivery methods that enable the student to control and manipulate the instructional environment. These active and interactive approaches to instruction may be situated within the framework of what may be called constructivist theories of learning.

According to Blurton (1999, p. 9), “[M]odern constructivist education theory emphasizes critical thinking, problem solving, ‘authentic’ learning experiences, social negotiation of knowledge, and collaboration—pedagogical methods that change the role of the teacher from disseminator of information to learning facilitator.” Works like Duffy and Jonassen (1992), Piaget (1973), and Strauss (1994) illustrate such new pedagogical theories.

So what is the role of interaction in these theories of learning? The author will now briefly mention four of these theories that are considered to be the most relevant. They are the constructivist theory of Bruner, the conversation theory of Pask and Vygotsky’s social development theory, and of course, Moore’s transactional distance theory (Moore, 1993).

### **Bruner**

An exposition of the constructivist theory is contained in works of Bruner (1966, 1990). According to Kearsley (1994-2004), a major theme in the

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