

Meaningful interaction in web-based learning: A social constructivist interpretation

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Abstract

Interaction is an essential ingredient in any learning process. However, every interaction does not lead to increased learning. When interaction has a direct influence on learners' intellectual growth, we can say the interaction is meaningful. The precise meaning of meaningful interaction is strongly related to the learning theories underlying the development of particular learning environments. The primary goal of this paper is to re-conceptualize online interaction in terms of meaningful learning based on the learning theory known as social constructivism. Analyzing interaction through this theoretical framework may yield design principles needed to improve the quality of Web-based learning environments. A secondary goal of this paper is to present the implications of meaningful online interaction for researchers and developers.

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1. Introduction

Instructional Technology is a design field in which people endeavor to increase the effectiveness of instruction and learning through the integration of pedagogy and technology. Instructional designers are practitioners within this design field. One of the key components of good pedagogy, regardless of whether technology is involved, is interaction. Interaction is an essential ingredient of any learning environment (face-to-face classroom-based, synchronous/asynchronous online education, or blended models). Interaction in learning is a necessary and fundamental process for knowledge acquisition and the development of both cognitive and physical skills (Barker, 1994). Thus, increasing interaction and enhancing its quality have long been important research goals for Instructional Technology researchers and instructional designers (Hannafin, 1989). Instructional designers believe the opportunities for and quality of interaction in support of learning can be improved by technology, a belief that has grown with the development of the Internet.

In Web-based learning environments, maintaining interaction is more challenging than in face-to-face learning contexts because of the time and space separation enabled by the technology (Angeli, Valanides, & Bonk, 2003;

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Bannan-Ritland, 2002). In the context of Web-based learning environments, researchers and designers (who are sometimes the same people) have shifted their focus from learner–content interaction to learner–learner interaction as well as from the quantity of interaction to its quality (Deubel, 2003; Moallem, 2003; Vrasidas, 2000). Despite advances, more and better research aimed at improving the learning effectiveness of online interaction is needed.

Unfortunately, instructional designers still lack sound theoretical foundations for determining what is good quality or meaningful interaction. Design guidelines for interaction in online learning are more akin to heuristics than to research-based principles. To provide a starting point for improving this situation, we will argue in this paper that interaction in Web-based learning should be re-conceptualized based on the learning theory known as social constructivism (Gergen, 1999). We will start with a brief review of the definitions and types of online interaction.

2. Defining online interaction

The nature of interaction in various forms of learning environments has been defined in a variety of ways, based upon the participants' level of involvement in a specific learning opportunity such as a university course or a corporate training program and the objects of interaction such as other participants or content materials. The nature of interaction is also dependent upon the contexts in which interaction occurs, in a face-to-face situation or at a distance.

Moore's (1989) classic definition of interaction within distance education is based upon a communication-based framework, defining the sender and receiver of three types of interaction: learner-content, learner-instructor, and learner–learner. Also within the context of distance education, Wagner (1994) defined interaction as “the reciprocal events that require at least two objects and two actions” (p.8). Such interactions are said to occur when these two objects and events reciprocally influence each other. Hillman, Willis, and Gunawardena (1994) insisted that these and other past discussions of interaction overlooked the fact that all interaction is mediated via a medium in technology-based learning situations. On the basis of their research, Hillman et al. added a fourth kind of interaction, learner-interface interaction to Moore's three types of interaction. More controversially, Sutton (2001) defined a fifth type of interaction, vicarious interaction, which “takes place when a student actively observes and processes both sides of a direct interaction between two other students or between another student and the instructor” (p. 227). Whether such “self-talking” or internal discourse interaction should be categorized with other forms of more directly observable interaction is debatable. Northrup (2001) proposed five interaction purposes: to interact with content, to collaborate, to converse, to help monitor and regulate learning (intrapersonal interaction), and to support performance.

Taking into account the previous definitions, Muirhead and Jumah (2004) described interaction as “a dialogue or discourse or event between two or more participants and objects which occurs synchronously and/or asynchronously mediated by response or feedback and interfaced by technology” (p.13). According to them, interaction serves a wide range of functions in the learning process: promoting active learning, enabling effective facilitation, allowing learner input in the learning process, enabling the development of higher order knowledge and abilities, and enhancing the quality and standards of the learning experiences.

3. The meaning of meaningful

Of course, every interaction in a Web-based learning environment does not have an influence on increased learning. Idle chatting, online surfing, or mindlessly clicking Web pages is unlikely to lead to substantive learning even though learners are interacting with other objects. In this context, Vrasidas and McIsaac (1999) focused on not just interaction but meaningful interaction. Hirumi (2002) also mentioned meaningful interaction emphasizing the quality of interaction on learning. Meaningful interaction is not just sharing personal opinions. Instead, the interaction must stimulate the learners' intellectual curiosity, engage them in productive instructional activities, and directly influence their learning (Hirumi, 2002; Vrasidas & McIsaac, 1999).

Depending on how learning is defined, the image of meaningful interaction is changed (Deubel, 2003; Hannafin, 1989; Vrasidas, 2000). That is, the meaning of meaningful interaction is strongly related to the learning theories underlying the development of particular learning environments. For example, in the behaviorist learning theory called operant conditioning (Skinner, 1954); learning is defined as a change in observable behavior. If the interactions in a

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