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Do Second-Generation Models Have More to Offer?

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Kraiger (2008) makes several intriguing points about the changing nature of training design and implications for social interaction, but we disagree with the claim that we are on the cusp of a third-generation instructional model built on social constructivism. Rather, we believe that advances in technology, such as the development of intelligent tutoring systems, are leading to greater refinement in second-generation models of training and development.

Kraiger suggests that social constructivism will be built on the cornerstone of learner–learner interaction and technology will facilitate these interactions. However, there are a variety of barriers to successful learner–learner interactions during Web-based instruction (WBI) that may limit the social construction of knowledge. First, research suggests that learners may be hesitant to engage in online discussions with individuals they do not know (Vonderwell, 2003). Providing access to online communication media does not guarantee that learners will choose to interact with one another. Surely, many of us can relate to experiences where we were forced to participate in online discussions, but the conversation remained superficial and aseptic. Second, online interaction fails to convey the nonverbal cues that are prevalent in face-to-face communication. For example, if a learner does not understand a point during face-to-face interaction, that information is often relayed nonverbally—allowing for immediate clarification of the message. Eliminating nonverbal cues increases the likelihood that messages will be lost in translation, and socially constructed meaning may lead to misconceptions rather than a common understanding. Messages without nonverbal cues can also leave room for ambiguous interpretation—was another learner's comment complimentary or sarcastic? This can lead to heated emotional exchanges if learners misinterpret each others' remarks. Third, advances in technology have made training more flexible, with the Internet facilitating access to customized training that is delivered anytime and anywhere. This allows learners to complete training on their own time—without having to consider the schedules of instructors or other learners. Increasing learner–learner interaction ultimately slows the process as learners coordinate schedules to meet in chat rooms or wait for others to respond to questions they posted on discussion boards.

Given the barriers to successful learner–learner interactions in WBI, we propose that the shift in the nature of training design is not toward social constructivism, but rather a movement toward incorporating technology to increase the effectiveness of

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second-generation instructional models. One such example is the use of intelligent tutoring systems. Intelligent tutoring systems simulate a human tutor who appears as an avatar and engages in conversations with the learner about the course content (Graesser, Jackson, & McDaniel, 2007). Intelligent tutoring systems work similarly to think-aloud or verbal-probed protocols in which a learner responds to the intelligent tutor's questions. Based on the learner's response, the intelligent tutor provides feedback, prompts for additional information (e.g., what else?), provides hints, and corrects misconceptions (Graesser et al., 2008). In addition to focusing on learners' cognitive states by assessing knowledge levels and identifying knowledge gaps, recent progress has been made where intelligent tutors can identify and adapt to learners' affective states (Graesser et al., 2007). Intelligent tutoring systems also encourage all learners to be active. They may be especially beneficial for learners who lack self-confidence and are more comfortable communicating with an intelligent tutor than with the instructor or other learners. In summary, intelligent tutoring systems may hold the key to maintaining the flexibility of WBI while incorporating the benefits of learner–learner interaction.

Future research is needed to examine whether learners receive the same benefits interacting with an intelligent tutor as they receive interacting with other learners and the instructor. The benefits of human interaction in WBI include decreased feelings of isolation and increased motivation while learning the material (Brown & Ford, 2002). In addition, research has shown synchronous communication has a positive effect on learning (Sitzmann, Kraiger, Stewart, & Wisher, 2006). In examining the future of intelligent tutors in training, several questions remain. First, will learners overlook the fact that they are interacting with an inanimate agent, such that the benefits of human interaction can be realized? If so, it is possible that interacting with intelligent tutors may overcome the limitations of traditional interaction during WBI. Second, will learners feel the same level of connection with an intelligent tutor as with actual learners, such that they will engage in the conversation and reach a deeper level of understanding of the training material? Third, will replacing traditional learner interaction with intelligent tutor interactions eliminate the fear of embarrassment because an inanimate agent cannot judge the learner? If the answers to these three questions are yes, we suggest that second-generation models still have more to offer before we should move on to the third generation.

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