

Chapter VIII

Training Sequences and their Effects on Task Performance and User Outcomes

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Abstract

This chapter introduces the concept of information technology (IT) training sequences and examines how sequencing of conceptual and procedural training impact IT task performance, user satisfaction and users' self-efficacy. Using assimilation theory, we develop four hypotheses related to training sequences. These hypotheses were then tested in a database design context using a quasi-experimental study involving student subjects. Empirical results demonstrate improved far-transfer and near-transfer task performance and higher self-efficacy for subjects trained in the conceptual-procedural sequence vs. the reverse sequence, though user satisfaction was not significantly different between the two sequences. Implications for IT training research are discussed.

Introduction

As IT has been widely adopted by firms as a potent means of improving task performance and user productivity in today's IT-dominated workplace, such adoption has also imposed substantial pressure on firms to continuously train internal users in the knowledge and skills needed to use these systems effectively. Despite innovations in the training domain, such as computer-based, CD-based and online training, the core issue still remains how training programs should be structured to improve IT users' knowledge retention and task performance given predefined technologies, tasks and potential users (Davis & Bostrom, 1993).

Several approaches to IT training have been proposed in the literature, such as instruction-based vs. exploration-based training (Davis & Bostrom, 1993), applications-based vs. construct-based training (Olfman & Bostrom, 1991), and conceptual vs. procedural training (e.g., Olfman & Mandviwalla, 1994; Santhanam & Sein, 1994). Of these, the last taxonomy seems to have gained the broadest acceptance. *Conceptual training* is a "top-down" approach where IT users are trained in the nature and associations of semantic objects required for comprehending and solving a problem, while *procedural training* is a "bottom-up" approach focusing on action-plan sequences that users should learn to complete specific tasks. Because of the direct and immediate applicability of procedural knowledge in specific task situations, procedural training has emerged as the approach of choice for many corporate IT training programs (Atlas, Cornett, Lane, & Napier, 1997).

Prior research on conceptual and procedural training has compared the relative effects of these approaches on IT task performance, reporting mixed results (e.g., Olfman & Mandviwalla, 1994; Santhanam & Sein, 1994). However, researchers tend to agree on the importance of both forms of training. Santhanam and Sein (1994) note that procedural training is more useful when the target system is easy to operate; however, these users tend to perform poorly on novel tasks. They also note, "conceptual training is likely to provide a better opportunity for a user to form a coherent mental model compared to procedural training" (p. 382). Elaborating the gaps in extant IT training research, Olfman and Mandviwalla (1994, p. 407) state, "some *combination* of concepts and procedures is needed ... It is the relative quantity and *sequencing* of the two kinds of content that has not been fully established" (emphasis added).

Defining *training sequence* as the ordering of conceptual and procedural training, the objective of this study is to examine whether the conceptual-procedural sequence improves IT task performance and user outcomes, such as satisfaction and self-efficacy, compared to the reverse sequence. Though the importance of training sequences was noted by Olfman and Mandviwalla (1994), to date, empirical analysis of such sequences has remained unexplored in the IT training literature. The idea of training sequences, however, has some support in learning theory (Glaser, 1990)

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