Chapter 19
Exploring the Effects of an Optional Learning Plan Tool in Technology–Enhanced Learning

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ABSTRACT
Self-regulated learners deal with a complex interplay of forethought, performance, and self-reflection processes. This might be a reason why many students struggle with regulating their learning in a technology-enhanced learning environment (TELE). Although TELEs provide various tools supporting self-regulation, research indicates that learners seldom use the tools meaningfully. This contribution investigates whether the provision of an optional metacognitive tool (i.e. a tailored learning plan) affects tool use, learning activities, and posttest performance in the TELE “Studierplatz”. To this end, students were instructed to use a learning plan in order to reach a predetermined learning goal. Results show that only 20% of the students used the tool. Furthermore, no significant effects on posttest performance were found. However, learning plan tool use positively affected working on learning goal relevant sections. These results are discussed with respect to current research on tool use in self-regulated learning with TELEs.

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INTRODUCTION

Technology-enhanced learning environments (TELEs) combine (a) multiple sources of information (e.g., instructional material, further readings, internet-links), (b) multiple information presentation formats (e.g., texts, graphics, simulations, learning tasks), (c) multiple modalities (e.g., visual or auditory information), and (d) multiple interaction possibilities (e.g., highlighting and note-taking functions, feedback to learning tasks, communication tools). Due to this, learners may select and examine from a large pool of information only those pieces necessary to meet their personal learning goals. They can process this material in accordance with their individual preferences and strategies at any time and from any place. Thus, TELEs show great potential for fostering students’ self-regulated learning (e.g., Azevedo, 2005b; Winters, Greene, & Costich, 2008).

Self-regulated learning is an active, constructive process in which learners set goals and then cyclically adapt their thoughts, feelings, and learning behaviors to attain their personal goals (Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 2000). This requires not only the goal-directed use of cognitive, but also of motivational and metacognitive strategies (e.g., Narciss, Proske, & Körndle, 2007). However, the universal access to multiple sources of information, as well as the non-linear structure and interactivity of TELEs, create additional demands on learners in all phases of the self-regulated learning process; the amount and structure of the learning materials can pose learners great difficulties. Learners have to choose permanently not only between various sources of information, but also between distinct information presentation formats, information modalities, and interaction possibilities (e.g., Bannert & Mengelkamp, 2008). During learning, various connections between these multiple materials from multiple sources of information need to be established. This process involves risks due to the non-linearity of TELEs and the learner’s own knowledge deficiencies with regard to content and strategy (e.g., Bannert, 2006; Foltz, 1996; Rouet & Levenon, 1996). Thus, learners might be distracted from their learning goals or lose their way in hyperspace; they may work on too much irrelevant information or only consume important information cursorily (e.g., Salomon & Almog, 1998). Some may not even start the learning activities as taking the first step onto this “mountain of information” can be perceived as an insurmountable task (e.g., Narciss et al., 2007).

In order to deal with this problem, many TELEs provide several instructional interventions aimed to support learners in applying efficient cognitive, metacognitive and motivational strategies (e.g., Schraw, 2007). However, empirical evidence on the effectiveness of instructional interventions is limited. The present contribution seeks to explore the effects of including an optional metacognitive tool in a technology-enhanced learning environment called Studierplatz. More specifically, the focus is on (a) how the use of metacognitive tools can be fostered and (b) how metacognitive tool use is related to learning behavior and performance in self-regulated learning with TELEs.

CHALLENGES OF SELF-REGULATED LEARNING WITH TECHNOLOGY-ENHANCED LEARNING ENVIRONMENTS

According to Zimmerman (2000) self-regulated learning involves three cyclic phases including forethought, performance, and self-reflection. These phases require learners to perform several cognitive, metacognitive, and motivational processes:

- Forethought: task analysis, self-motivation beliefs;
- Performance: self-control, self-observation;