

# Effectiveness of an Intelligently Adaptive CAI Environment with Cognitive Apprenticeship on Self-regulated Learning Skills

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**ABSTRACT:** A group of cognitive psychologists identifies effective learners as self-regulated learners who are metacognitively, motivationally, and behaviorally active. This study was concerned with how to prepare computerized learning environments to help the ineffective learners become effective self-regulated learners. This study investigated the effects of two different computer-assisted instructional (CAI) environments and the effects of self-awareness of cognitive tempo styles on college students' self-regulated learning (SRL) skills and their academic achievement scores. MANOVA tests revealed that an intelligently adaptive CAI environment was significantly more effective on behavioral SRL skills than a totally learner-controlled CAI environment. This study suggests that educators and instructional designers invest their efforts in developing and utilizing CAI that serves as an intelligent partner to human cognition and that helps learners become self-regulated learners.

## Theoretical Framework

Recently developed computer-assisted instruction (CAI) allows learners to have highly individualized interaction with the computerized instruction. Research studies, however, revealed that neither totally program-controlled CAI environments nor totally learner-controlled CAI environments provide high motivation toward the learning processes and high achievement outcomes [Steinberg, 1989]. Therefore, consideration should be given to designing CAI environments with appropriate instructional methods, which more intelligently interact with individual learners and guide them toward acquisition of required knowledge and skills in each step of learning processes.

Current computer authoring system technology enables instructional designers and developers to incorporate special constructivistic instructional methods such as cognitive apprenticeship into CAI environments [Lajoie & Lesgold, 1989]. Researchers and practitioners of the cognitive apprenticeship teaching method suggest that cognitive knowledge and skills can be taught by cognitive coaching strategies and learned better by *learning-through-guided experience* [Collins, Brown, & Newman, 1989]. When learning is completed, learners will increase learning responsibilities and shift expertise from the computerized coaching system. The process of learning responsibility and expertise shift can be observed by the utilization of self-regulated learning (SRL) skills: that is, metacognitively, motivationally, and behaviorally active involvement in their learning processes [Zimmerman, 1994].