

# Does The Use of AI Lead to Better Learning? The Effects Of AI-Supported Knowledge Learning on University Students' Learning Outcomes

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## Abstract

The widespread adoption of AI has significantly transformed students' approaches to knowledge acquisition and learning. Extending dual learning theory to the context of AI-supported knowledge learning, this study conceptualizes AI exploratory learning as a learning approach in which students first engage in independent thinking to form preliminary ideas and then interact with AI to refine and elaborate those ideas. In contrast, AI exploitative learning is defined as a learning approach in which students directly rely on AI to obtain answers. We conducted a classroom experiment in a management course, assigning students to one of three conditions: AI exploratory learning, AI exploitative learning, and learning without AI. Students were required to complete both theoretical and practical knowledge learning tasks. The results show that the germane cognitive load of both the AI exploratory learning group and the no-AI group was significantly higher than that of the AI exploitative learning group. For analytical tasks involving theoretical knowledge, both AI-supported groups outperformed the no-AI group. However, for analytical tasks involving practical knowledge, the no-AI group and the AI exploratory learning group performed significantly better than the AI exploitative learning group. In creative tasks, regardless of theoretical or practical knowledge, the AI exploratory learning group demonstrated significantly higher levels of creativity and originality than the AI exploitative learning group. Overall, AI-supported learning can enhance students' performance on well-defined learning tasks. However, AI exploratory learning induces higher cognitive load than AI exploitative learning and leads to superior performance on creative tasks.

**Keywords:** AI Exploitative Learning; AI Exploratory Learning; Cognitive Load; Creative Task; Experimental Study

