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Title	知識創造型学習支援システムiroha Compassの開発と研究活動への適用
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Abstract

This study designs a learning support system suitable for knowledge creation learning and demonstrates its effectiveness and use. Currently, active learning and 21st-century skills are attracting attention in school education, and the purpose of learning is changing from knowledge acquisition to knowledge creation, and research is becoming more active.

Since the 2000s, with the spread of the Internet and ICT devices, e-learning, which is learning using information technology, has been spreading around the world. In addition, the need for online learning support is rapidly increasing after COVID-19. However, most existing learning support systems mainly focus on knowledge acquisition, and there has been little research on systems that support knowledge-creating learning.

To promote knowledge-creating learning, a "Ba" where learners and instructors can share learning themes and tasks and engage in dialogue is essential. The purpose of this study is to design a knowledge creation learning support system as a "Ba" for knowledge creation learning and to demonstrate its effectiveness and usage. Conventional knowledge creation type learning support systems are often used in cooperative learning in which multiple learners participate in a single learning theme, but in this study, I will apply the system to self-directed, individual theme-based learning in which each learner works on a different learning theme and the instructor participates in those learning themes.

Specifically, I created a hierarchical model (TTP model) that manages information in knowledge creation learning at three levels (theme, task, and progress), and based on this model, I designed and developed the "iroha Compass," a knowledge creation learning support system that allows learners to manage their own learning themes and progress. In addition, I focused on research activities as an individual theme-based knowledge creation learning, conducted evaluation experiments, and clarified the relationship between the frequency of progress and performance and emotion and motivation when using the knowledge creation learning support system. It was also defined as an "idea map," a diagram that visualizes knowledge and ideas using cards, links, and groups, concerning existing convergent creativity techniques. It was then evaluated to clarify the impact of idea map creation on intellectual writing. As a result of the long-term use of iroha Compass over a period of four years, I was able to confirm examples of use in organizing knowledge and deepening thinking, and changes in thinking through the aggregation of log data and analysis by word cloud and found the possibility of examining the status of work sharing, dialogue, etc. with instructors.

Knowledge creation learning is characterized by the fact that the tasks each student tackles are different and that the learners are self-directed. In recent years, "individualized optimal learning" has been attracting attention in school education. To support such learning, it is difficult for conventional learning support systems that are designed to teach the same content all at the same time to cope with this learning, and it is expected that individualized theme-based knowledge creation learning support systems that can provide individual guidance according to each student's learning theme and progress will be required in the future. The results of this research are expected to be used in such school education fields and laboratory activities at higher education institutions.

Keywords: knowledge creation learning, idea map, creative techniques, e-learning, active learning