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Will defend the dissertation on

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Time: 12:30 P.M.

Pullman Campus – Education Addition 202

Zoom available upon request to gradstudies@wsu.edu

Faculty, students and the general public are encouraged to attend

CONCEPT MAPPING AND REFLECTION PROMPTS ON CHEMISTRY LEARNING PERFORMANCE

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There is growing support for combining concept mapping activities with metacognitive strategies such as reflection prompts to improve student outcomes in difficult science concepts. Although concept maps and reflection prompts have been widely shown to be effective for learning, little is known about the effect of various concept map types combined with reflection prompts on student learning and cognitive load. We conducted two experiments to examine the comparative effectiveness of different types of concept map activities and reflection prompts. In experiment 1, we compared the effectiveness of individual or collaborative concept map types combined with the presence or absence of reflection prompts. Undergraduate students enrolled in an introductory general chemistry course were randomly assigned to the four conditions. Each concept map group entirely constructed the relationship between concept on the topic of gas. Results showed a main effect for concept map types, with individual concept map groups outperforming the collaborative concept map group. In addition, participants in collaborative concept map group and no reflection prompt group report lower cognitive load compared to other conditions.

In experiment 2, we compared the effectiveness of three collaborative concept map formats (correction concept map, fill-in the blank concept map and self-generated concept map) combined with the presence or absence of reflection prompts on undergraduate students' learning outcomes. Students (N = 480) were randomly assigned to one of the six conditions on the topic of quantum numbers. The dependent measures were tests of posttest and cognitive load score. The study found no interaction effect between the collaborative concept map formats and reflection prompts. There was no significant difference between the three collaborative concept map formats. However, collaborative correction map mean outperformed the means of collaborative scaffolded and self-generated maps. The reflection prompts provided no additional benefit over no reflection prompts because participants in both conditions were able to engage at interactive level of collaboration.