The Efficacy of Cross-Discipline Representations for ill-defined IAS Concepts

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This study examines ways of increasing learner’s expertise of ill-defined concepts through the use of varying types of representations.

Research Questions:

Are representations of ill-defined concepts within the same discipline as effective as cross-discipline representations in increasing expertise in learners?

To what degree do additional representations of ill-defined concepts increase the conceptual understanding of learners?

Methods:

3 Days of Treatments
3 Groups

Model Eliciting Activities

To help with the instructional design of MEA’s, six principles were developed during a series of 10-week research studies. They include:

1. The Personal Meaningfulness Principle
2. The Model Construction Principle
3. The Self-Evaluation Principle
4. The Model Externalization Principle
5. The Simple Prototype Principle
6. The Model Generalization Principle

3 Days of Measurements

Scoring of Students Concept Maps

Student Concept Maps

Expert Concept Map

Results:

p - values

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<tr>
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<th>Day 1-2</th>
<th>Day 2-3</th>
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<tbody>
<tr>
<td>Inner</td>
<td>.05*</td>
<td>.61</td>
<td>.00*</td>
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<tr>
<td>Cross</td>
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<td>Control</td>
<td>.05*</td>
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Future Research

Future research may include looking at how cross-discipline representations of ill-defined concepts affect the ability for students to apply the conceptual understanding to new “far-transfer” problems.

IAS students will need to learn how to grapple with uncertainty in their professional lives, hence encountering uncertainty in the classroom is an important aspect of their education and understanding how to teach ill-defined areas is an important aspect of the curriculum.