The Effect of Modeling Innovative Technology Use in STEM Teacher Education on Teacher-Candidates' Knowledge for Teaching and Views on the Nature of Science

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- A B.Ed. opens up a whole world of opportunities in classrooms & beyond
- ~700 K-12 teacher candidates annually
Modeling Innovative Pedagogies

**Family Mathematics and Science Day at UBC Faculty of Education**

**by Marina Milner-Bolotin and Valery Milner**

Despite the continuous efforts of provincial governments to revise and improve science, technology, engineering, and mathematics (STEM) K-12 education, the performance of Canada’s youth on international assessments, such as PISA, is gradually declining [1, 2]. Moreover, many Canadian youth turn away from STEM subjects in secondary schools, thus closing doors to exciting and economically viable future career opportunities [3]. Preparation is likely to be rather limited. As a result, many British Columbia K-9 teachers struggle to engage their students in meaningful STEM learning. In order to support teacher-candidates in acquiring positive attitudes about STEM and learning how to engage children and their families in informal STEM education, we founded the UBC annual STEM MathFest.

**Investigating the effect of question-driven pedagogy on the development of physics teacher candidates’ pedagogical content knowledge**

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This paper describes the second year of a multi-year study on the implementation of Peer Instruction and PeerWise-inspired pedagogies in a physics methods course in a teacher education program at a large research university in Western Canada. In the first year of this study, Peer Instruction was implemented consistently in the physics methods course and teacher candidates were asked to submit five conceptual multiple-choice questions as a final assignment. In the second year of the study we incorporated PeerWise online tool to facilitate teacher candidates’ design of conceptual questions by allowing them to provide and receive feedback from their peers, and consequently improve their questions. We have found that as a result of this collaboration teacher candidates improved their pedagogical content knowledge as an outcome of the rubric developed for the study.

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**Modeling Active Engagement Pedagogy through Classroom Response Systems in a Physics Teacher Education Course**

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**Abstract** One of the most commonly explored technologies in Science, Technology, Engineering, and Mathematics (STEM) education is Classroom Response Systems. However, these systems do not merely engage students in lesson activities, but also decrease the distribution of question-asking to teachers and increase the distribution of question-asking to students.
What knowledge do teachers need to acquire to be successful science teachers?

Knowledge for Teaching Science

Directions for Further Research

• What knowledge for teaching do we want TC to acquire?
• What matters for STEM teacher education?
• How do we facilitate this knowledge acquisition?
• What is the role of TCs’ active engagement in teacher education?