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Undergrads at a Synchrotron? Innovative Approaches To Include Research Experiences In Undergraduate Courses

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Research into education strategies has repeatedly shown that actively engaging students results in stronger learning of core concepts (Korff, 2016). Calls to include experiential, inquiry-based strategies, particularly in STEM (Science, Technology, Engineering and Math) education have been persistent (Zhang, 2016). Many institutions are searching for ways to accomplish this, and research institutions are searching for ways to showcase their accomplishments and attract potential new researchers. The Canadian Light Source (CLS) has developed successful education programs for high school students that focus on the process of research and provide as close to an authentic research experience as possible (Walker, 2013). This presentation will describe how the CLS collaborated with faculty at the University of Saskatchewan to pilot several methods of including authentic research experiences for undergraduate students at the first and upper years. Keeping student driven research utilizing synchrotron techniques as the core of the experience, we have explored the following methods: 1) a tutorial in a first year Environmental Science course, 2) a course centered around a collaboration between third year students from the departments of Chemistry and Classical, Medieval, & Renaissance Studies, and 3) a course centered around a concurrent experience in scientific inquiry and the pedagogy of inquiry for curriculum studies students in the college of education. Elements of success and areas where improvement is required will be shared from the perspective of student engagement and learning, faculty involvement and resources, and working with research laboratories. While using Canada's only synchrotron is a hook to attract students, we propose the methods we explored could be successful using any research technique.

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