Lifestyles Project: An Interdisciplinary Integration of Mathematics with Science, Arts and English

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Research Focus

In interdisciplinary teaching and learning, curriculum is organized around the common learning across various disciplines (Helmane & Briška, 2017). In this approach, two or more than two disciplines are integrated to give students an opportunity to examine a theme, topic or issue that requires disciplinary knowledge of multiple disciplines (Jacobs, 1989). The interdisciplinary teaching and learning approach has multitude of benefits for mathematics education, particularly when it is combined with arts and/or languages in addition to science (Serrano Corkin et al., 2020; Williams et al., 2016). Interdisciplinary mathematics teaching allows to present mathematics in a wider everyday context (Chi, 2021) and encourage the skills of problem solving and inquiry among students (Williams et al., 2016). Hence, the Canadian education system, particularly Quebec's Education Program (QEP), places extreme emphasis on interdisciplinarity and cross-curricular competencies to ensure meaningful mathematics education (Québec Ministry of Education, 2007b, 2007c).

However, interdisciplinarity remains a principal issue in the secondary education of Quebec since very long. This is primarily because the novice secondary teachers face multiple challenges when it comes to implementation of interdisciplinary learning in their classrooms (Hasni et al., 2015; Lenoir & Hasni, 2010). One of the least-discussed challenges is lack of adequate practical examples to learn from, particularly for novice teachers seeking to adopt interdisciplinary teaching and learning into their practice (Lindvig & Ulriksen, 2019). Hence, we argue; how can novice secondary teachers from Quebec develop and implement the interdisciplinary work in mathematics education when there exists lack of practical and rational examples of interdisciplinarity? In an attempt to address the highlighted issue, our paper discusses an example from a Quebec school where interdisciplinary mathematics education was taught in Secondary 2 classroom (Grade 8). The aim of this paper is two-fold: 1) illustrate the process of developing an interdisciplinary mathematics project that serves as a practical application of interdisciplinary teaching and learning approach in secondary education, and 2) share insights and recommendations that can be used as a guiding framework for implementation of interdisciplinary education, particularly interdisciplinary mathematics education, in secondary classrooms of Quebec.

Research Context

The study took place within a context of a research-practice partnership with a private school located in Quebec. The year-long interdisciplinary project, called Lifestyles Project, was designed and implemented in the Secondary 2 classroom (Grade 8). Lifestyles Project

involved the interdisciplinary integration of mathematics with science, English and arts. This Project was aligned with the Quebec's Broad Areas of Learning and Cross-Curricular Competencies for Secondary 2 education (Québec Ministry of Education, 2007a, 2007b). The project schedule was set up such that all assignments of the Lifestyles project were interspersed throughout the year, each spanning 2-3 weeks in length. Lifestyles Project was sub-divided into three assignments: the Hobbies, Careers and Bedroom Design assignments. In Hobbies assignment, each student selected a hobby of personal interest to explore and research the mathematics and science inherent in the activity. Next step of the Lifestyles Project was to involve students in Careers assignment that required application of the disciplinary knowledge from mathematics and English. Students had the option to either choose a career suggested by their aptitude test or pick a different career of their interest. Next, students found a job within Canada for the chosen career by visiting a job posting website and then conducted research to calculate their salaries (including tax deductions). Last assignment was the Bedroom Design assignment where students were tasked with the design of a 3D, scaled model of the bedroom of their dream apartment. While designing their bedrooms, students had to consider mathematical (e.g., size, surface area) and artistic constraints (e.g., low-relief design technique).

In the full paper, we will first discuss the comprehensive process of designing an interdisciplinary mathematics education project through the example of Lifestyles Project that was implemented in the Secondary 2 (Grade 8) classroom of the Quebec School. This discussion will be followed by the meaningful insights and recommendations to help teach mathematics in an interdisciplinary format in secondary classrooms.

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