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Leveraging on Work Integrated Learning to Enhance Sustainable Design Practices in the Construction Industry

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Abstract

Sustainability in all aspects of our life is certainly an emerging trend. All industries including Construction Industry are taking active initiatives to support sustainability practices. Construction always has been a major player in Canada's economy. In the global economy, construction occupies a still larger position. Around the world this industry accounts for \$8 trillion a year of economic activity or about 15% of the world's GDP. Moreover, this amount is projected to grow to \$12 trillion by 2020. During this time period, Canada is expected to move from seventh to fifth place in terms of the world's largest construction market. This emphasizes the need for aptly trained professional in all domains of sustainability.

There is a growing need for design and construction professionals with sustainability skillsets, which are crucial for enhancing sustainability practices, especially given the growing complexity of construction projects and construction-related environmental law. Academic institutions have a responsibility to address this emerging need of the industry to support national economy.

Construction projects are complex because they involve many human and non-human factors and variables. Design and construction students learn more effectively where they get involved in life-cycle of a building project i.e., from conceptual design to completion stage dealing with major issues like resources, cost, quality and time. Project-based learning is an appropriate paradigm for addressing design and construction project management problems. Due to the technical expertise required for sustainable building projects, it is integral for learners to go through a practicum environment to understand the sustainability aspects of a construction project in the industry environment.

Work Integrated Learning (WIL) is becoming increasingly popular as an essential pedagogy for undergraduate construction education. Active participation through WIL provides the students with an experiential learning experience in a professional environment in the industry. Sustainable design is the backbone of sustainable built environment. Training professionals with the core skillsets and competencies in the sustainable construction domain requires an interdisciplinary design and construction

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project platform. Interdisciplinary projects lie at the heart of training architects and construction professionals with sustainable design practices.

This paper sets the foundation for an interdisciplinary sustainable construction lab providing an invaluable platform for students from Architecture, Construction, Civil Engineering, Alternative Energy, Project Management and Construction Trades programs to work on a sustainable building project collaboratively. The research paper recommends that WIL in an interdisciplinary project environment is an effective pedagogy for transferring technical knowledge and soft skills related to sustainable design and construction to young professionals that eventually enhance their employability in the construction industry. The research findings will be valuable for all professionals, academicians and researchers involved in sustainable design and construction practices in the construction industry.

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1. Introduction

Construction is and always has been a major player in Canada's economy. It employs close to 1 million Canadian men and women and chalks up volumes of \$123 billion annually [1] and has been accounting for about 12% of Canada's GDP. The construction industry has a growing need for management professionals and effective project management, especially given the growing complexity of large construction projects and construction-related law [2]. Construction requires a broad skill set in a variety of areas, and construction project managers are ultimately responsible for every aspect of their projects, including planning and scheduling project activities; managing employees, contractors, equipment and materials; project design; and budgeting [3].

It is commonly accepted that the construction industry has, for many years, been criticized for not developing consistent projects that are on time, within budget and with high quality standard [4,2]. Generally, failure to deliver successful projects has been considered in relation to schism between design and construction, lack of integration, lack of effective communication, uncertainty, changing environment, and increasing project complexity [5]. Committed and aptly trained people with high team spirit are essential for successful completion of construction projects [6]. The capability of the construction industry to develop, procure and deliver innovative, complex and demanding projects is driven by involvement of highly knowledgeable and skilled construction professionals [1]. Training through experiential learning has long been identified and recognized as one of the fundamental and key processes within the construction industry to assist organizations meet the need of construction professionals with these qualities.

Construction-related programs face a significant challenge of providing students with applied knowledge that works in industry [7]. It is, therefore, not surprising that construction programs are allocating more time in their curricula to provide students with such learning opportunities [8]. As a way of meeting this need, a number of technological and pedagogical innovations were designed, tested, and implemented successfully into construction programs. These innovations include internships, multimedia-based learning, service-learning projects, simulation, and games [9].

Workplace learning is associated with two quite different purposes, the first being the development of the enterprise through contributing to production, effectiveness and innovation and the second being the development of individuals through contributing to knowledge, skills and the capacity to further their own learning both as employees and as citizens [10]. It is imperative for undergraduate students to gain, in addition to an academic, professional or vocational education, the competencies, skills, attitudes and values that equip them to contribute to industry [11]. The inclusion of WIL curricula in university programs is becoming increasingly common in the higher education sector [12]. Impetus to the WIL is provided by the Industry, which is increasingly looking for the graduates with shorter learning curve and whose skills can match the day-to-day challenges and needs. WIL provides one of the tools to allow academia to align the curriculum to match these needs.

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