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Integrating Green Concept in Built Environment Curriculum

¹Nor'Aini Yusof, ²Nazirah Zainul Abidin and ³Atasya Osmadi

^{1,2,3}School of Housing, Building and Planning, Universiti Sains Malaysia

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ABSTRACT

Construction industry professionals are facing tougher environmental regulations, and demands from clients to be more cautious of how their actions affect the environment. Despite these pressures, there is little evidence as to how much the pressure actually results into an increased green practices within the construction industry. This study sets out to scrutinize the ideas of industry professionals as to how they feel they can improve green practices amongst their peers. Specific participants were chosen from the industry, and they were asked how they thought it best to educate future graduates on the implementation of green practices into tertiary curriculums which would therefore result in a greater application of green practices throughout the industry. Respondents put forward several ways green practice could be increased in the construction industry by new graduates including, course content that is well-rounded and covers various aspects of the industry, a university curriculum that employs green practices and industrial training.

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INTRODUCTION

The Malaysian government has taken a vested interest in improving green practices in the local industry. They have put forth two policies that force construction industry players to take in to consideration the eminent environmental issues of the day with regard to the daily operations; i) the Business Sustainability Programme for Corporate Malaysia whose goal is to support publically listed companies to include eco-friendly, community and governance issues in their daily business functions, and ii) the 5th Strategic Thrust of the 10th Malaysia Plan where under this plan the government will encourage green practices (GP) in the construction industry by initiating a green-rating system [1].

In addition to the government's efforts, construction industry professionals must be aware, have the knowledge, and be motivated to implement green concepts (GC) otherwise GP in the construction industry cannot come into fruition [2, 3]. It is widely believed that the best practices in the construction industry ought to include accountability to the environment that includes providing a sustainable future [4]. These best practices cannot be implemented effectively if the graduates of built environment are not taught these standards of operation and more importantly, made aware of the consequences of ignoring or failing to meet the minimum standards for sustaining the environment [2]. Construction industry students cannot be attentive to GP unless the built environment curriculum ascribes to a broad sustainable development agenda that promotes social and economic aspects in addition to environmental issues [4, 2]. How should curriculum designers choose the areas to include when universities cannot agree on the content of the courses to be offered and how to deliver these courses [2]? In other words, the question arises: Which aspects of green practices must be included in a built environment curriculum in order to develop the social and environment mindfulness of future graduates?

This study aims to contribute practically by presenting conclusions that aid universities in planning and creating programs that expand the future adoption of GP by graduates in built environment. The conclusions present precise policy suggestions aimed at encouraging GP amongst relevant construction industry professional bodies. Moreover, this is done in hopes of expanding the green initiatives taken on by the industry and encouraging the success of Malaysia's green policy while furthering wider goals of sustainability.

Literature Review:

There is no argument about the importance of including GC in the curriculum of built environment courses in universities [2, 5]. Students are better able to conceptualize GP in their endeavors when GC is stressed during their university study [6]. Many environmental problems can be attributed to irresponsible behavior. This behavior can be corrected through environmental education [7]. The demand for professionals with a keen environmental awareness is growing due to the fact that construction firms are adopting evermore GP [2]. Graduates of built environment will most likely hold positions as decision makers, such as contractors, developers, or consultants within the construction industry after graduation. They will have the opportunity to implement green practices as they will be responsible for choosing building materials and technologies used [7]. The knowledge of GC can be taught to these future decision makers by including it in the built environment curriculum. This can be done by developing new courses that center only on GC or by implanting GC concepts into current courses [8]. An exhaustive review of the present literature reveals a striking lack of agreement as to what aspects of GC should be incorporated, and how to teach them. Of the American universities that offer built environment programmes, a popular title for these courses has been 'sustainable construction' [2]. Regardless of the sharing of the course name, these courses, across institutions, have significant differences in course objective, level of the courses and prerequisites for enrollment [2]. Furthermore, only one-third of these schools offer individual courses on sustainable construction [2]. Even with this example, it is not unexpected that there is so much debate on the knowledge and skills to include in a GC curriculum because of the multifaceted and disjointed character of the construction industry itself.

It's been said that in order to prepare graduates with the necessary know-how and expertise of GC, built environment programmes should offer entirely new GC course content although the specifics of this content has not been specified [9]. Others suggested a list of GC modules that could be included in current built environment courses. These modules could incorporate renewable energy, product development and design using recycled material, and management practices that support green philosophy and strategy [10]. Further suggestions focus on the need for the curriculum to center on ideologies of sustainable construction in the design and construction phases while also developing a grasp of the green politics and supervision of a healthy built environment [7]. GP can be promoted by teaching students how to push change in the industry as well as their communities [11].

It has been suggested that the courses use a problem-based approach to learning and should be delivered in terms of multidimensional aspects of environmental education that focus on examination, comprehension and awareness of environmental issues [12]. Another way to increase students' awareness and knowledge about environmental and social sustainability issues is to implement built environment courses that utilize service-learning [13]. An older suggested approach proposed teaching GC through case studies as the construction industry is complex and case studies allow student to investigate the complicated issues of the industry with regard to GP [14]. There is no unanimity among scholars as to how to deliver, or what to include in a built environment syllabus. The necessity for this study is confirmed by this problem.

Methodology:

Thirteen targeted respondents, who agreed to provide detailed information, were chosen and in-person interviews were conducted. All of the participants were construction industry professionals working in the Northern region of Peninsular Malaysia. They were chosen for this study as they have all overseen both undergraduates and new-graduates of built environment programs throughout three month industrial training programs, or graduate internships. Due to their direct interaction with undergraduates and graduates, in terms of evaluating their performance and deciding whether or not to employ them, the opinions of these respondents are extremely useful to this study. The data collected during the interviews was examined using an editing style which includes a procedure of describing, organizing, connecting, corroborating and representing the account.

Eight of the respondents are male and the most of them work in contractors' firms (54 percent), followed by developers' firms (31 percent) and consultant firms (15 percent). As to their job description, over 46 percent of the respondents work in technical areas such as site supervisor or site engineer, followed by 38 percent that work as consultants and 16 percent who are at the management level. The majority of the respondents (54 percent) had between three and nine years of work experience, while the remaining have more than ten years of work experience.

RESULTS AND DISCUSSION

Present environmental concerns were discussed with the participants. They agreed to give suggestions as to how to increase GP in the industry. Most respondents agreed that in order to increase GP in the future, graduates in built environments such as engineering, architecture, construction, or project management and planning will have to be properly educated about environmental issues. Syllabi of built environment courses will have to

incorporate green approaches and be sensibly created. Their suggestions were organized into three main themes as outlined below:

Well-rounded Course Content:

One of the professionals interviewed said that if graduates only learn about GC, it's not enough to necessarily increase GP. In addition to learning about it, they have to adopt GP themselves, and have to be able to influence others to do so as well. Different participants agreed that restricting course content to technical and economic issues would be a mistake as sustainable development involves environmental and social factors as well. Additionally, they recommended that courses include instruction on social and regulatory issues too. Based on these suggestions, the necessity for adjustments to current course objectives in order to implement these additional principles is presented.

Integrating GC in the university curriculum:

Seventy-five percent of the interviewees agreed that if GC is put into university curriculums, students will be better able to react to environmental problems efficiently. The participants could not agree if there should be new courses independent from already existing courses. Instead they proposed the GC could be included in all courses as a core aim that students must achieve. Similarly, one participant pointed out that in addition to assessing project performance based budget, schedule, and specifications, social elements ought to be taken into account as well. Conversely, respondents agreed that the current syllabus should not be watered-down in order to make room for GC content. The way to do this is to make use of problem-solving and multi-disciplinary studies.

Industrial training:

It was agreed by almost all of the respondents, that students need real-life experience in order to see how GP is implemented in the industry. Students can get this experience through industrial training which gives them the opportunity to apply the GC theorized in school, to real-world situations. Other benefits of industrial training include the fact that it serves as a stable foundation for understanding the many facets of the green agenda. Another benefit of industrial training is that it allows for a wide variety of learning areas that includes technological, environmental and socio-economic factors and therefore prepares graduates for the interdisciplinary nature of the construction industry. One example of this is the opportunity to practice making decisions despite limited information throughout the early training.

Summary:

This study examines how to improve the knowledge of GP among future built environment graduates which can therefore influence the use of GP in the construction industry. Industry professionals were sought out for their opinions on the subject. They made three primary recommendations for approaching this task. They suggested integrating GC into the built environment curriculum, including wide-ranging course content, and providing future graduates with industrial training. Only practitioners in the construction industry were interviewed for this study due to limited funding and research time. Therefore, the suggestions are not as broad as they would have been, had the study also considered the opinions of the government, professional bodies and academics. Future exploration on the topic should include input from these groups, offering alternative views, and thus adding value to the research. Improving the built environment curriculum while consulting these various stakeholders, will simultaneously improve the construction industry's green performance. If we can improve our knowledge on what facilitates GP initially, then we can better aid the construction industry and local authorities to develop strategies of their own that increase GP across the industry.

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